DuraPack® 5000



PARTS and SERVICE MANUAL

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INDEXES

This catalog has been developed into eight sections for easy access and use. The first seven sections contain the replacement parts on the DuraPack 5000 and arranged for easy identification of Heil service parts.

Section 8 contains information on maintenance/adjustment of the unit. It contains information on maintenance, adjustment, troubleshooting and hydraulic and electrical schematics.

UNDERSTANDING THE PARTS LISTING (IMPORTANT)

Understanding how to use the parts listing is important for proper use of this catalog. Below is a sample parts listing with four (4) columns. The first is the reference number column, the second is the part number column, the third is the descriptive column and the fourth is the number required column.

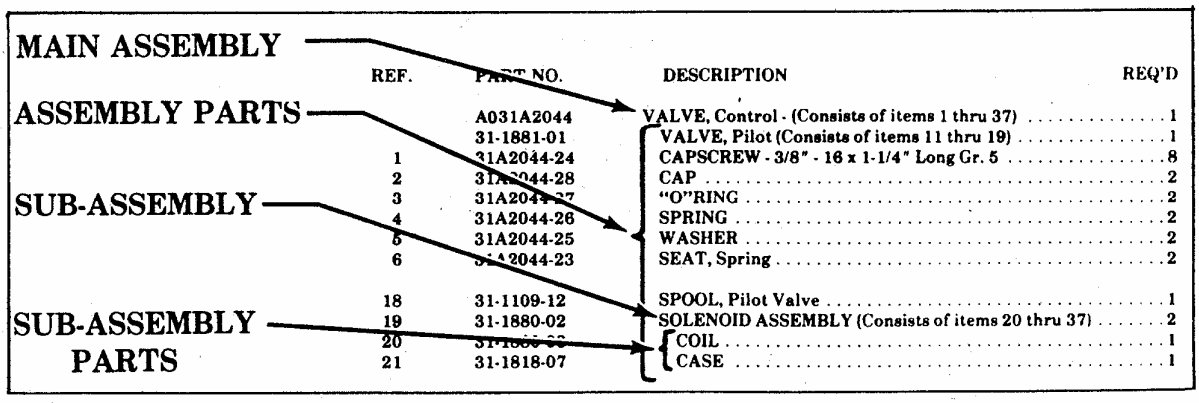
The numbers in the “REF.” column are numbers corresponding with the circled reference numbers on the parts illustration for each replacement part.

The numbers in the “PART NUMBER” column are the numbers used to order particular replacement parts. Be sure when ordering parts, that the number is written correctly.

The “DESCRIPTION” column is used to describe the replacement parts. In this column will be found indented descriptions. These indented descriptions are a part of the preceding assembly or sub-assembly (see example below). In other words, the CONTROL VALVE ASSEMBLY is the main assembly and all indented descriptions under it are the parts that comprise the assembly. Also, in some cases, sub-assemblies may appear under an assembly. Again, the parts that comprise the sub-assembly will be indented under the sub-assembly.
(See the Solenoid Assembly, Item 19 in the example below).

The quantities shown in the “REQ’D” column are the numbers of parts used on a unit, except where parts are indented in the description column. In this case, the quantity shown is the number required for the preceding assembly or sub-assembly. For example, check the quantities of the Solenoid Assembly (item 19 in example below). There is a quantity of 2 per each unit. Now check the quantities for the indented items under the Solenoid Assembly. These quantities are for only one solenoid, not for the two.

PLEASE read each column carefully to ensure correct parts ordering.



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NOTES AND DESIGNATIONS

Illustrations and (or) parts listing may be shown with notes or designations which apply to specific models. Where an illustration and (or) parts listing is shown without notes or designations, this indicates the parts listing covers all models.

A/R = AS REQUIRED

NSS = NOT SERVICED SEPARATELY

Ref. = REFERENCE

CATALOG CHANGES

When changes to the unit make it necessary to revise portions of the catalog, revised pages will be issued with the same page number as those they replace and the issue date will be advanced.

SERIAL NUMBERS

The body serial plate is located on the left side front corner of the unit.

HOW TO ORDER PARTS

When ordering parts for a specific unit, always include the body and/or hopper model and serial number on your order. Order parts by description, part number and quantity desired.

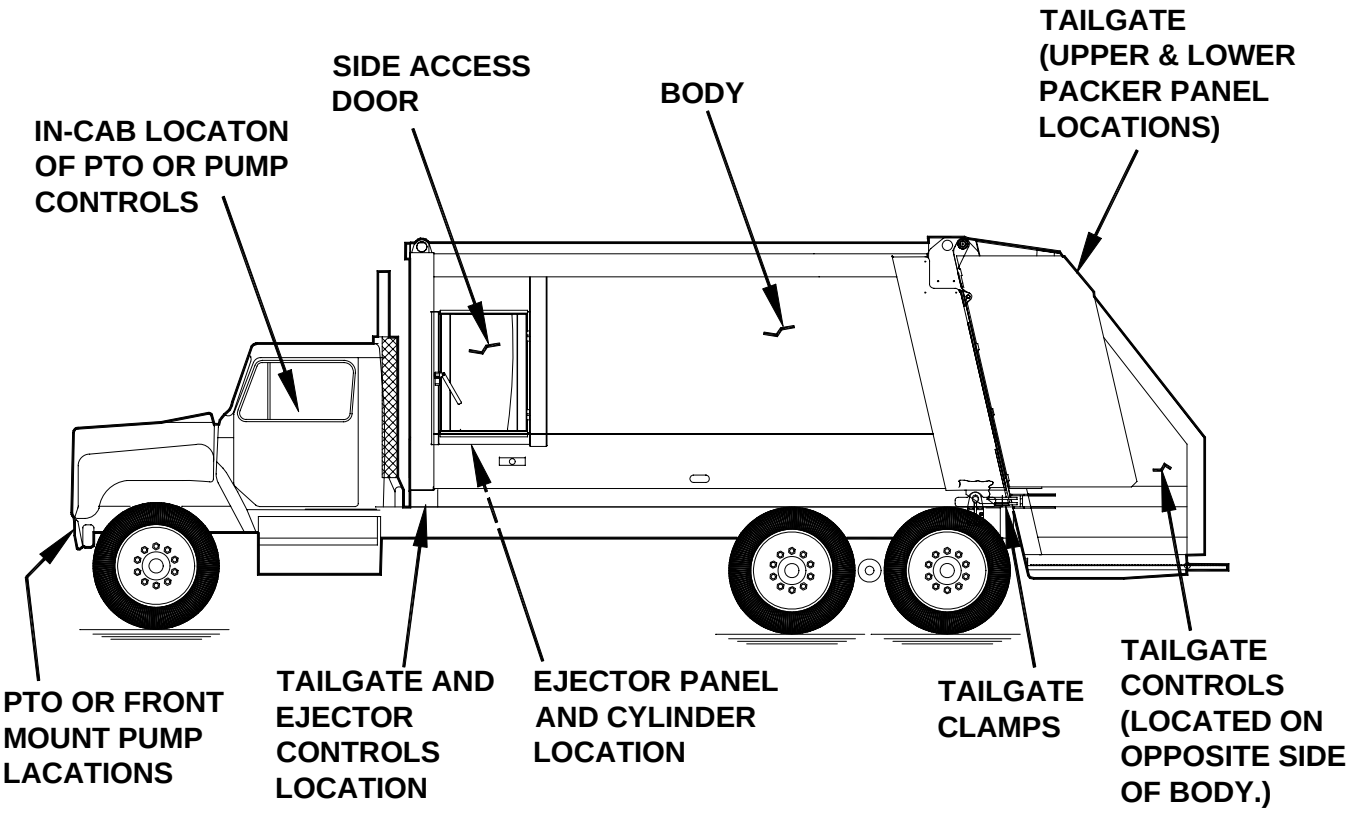
Give specific instructions. We want your order to reach you as quickly and economically as possible.

Contact your HEIL distributor for parts and service.

HEIL Environmental Ind. Ltd.
Product Support Facility (Parts and Service)
4301 N. Gault Ave.
Ft. Payne, AL 35967
Phone: (256) 845-6446 (Customer Service
(800) 251-7258 (Customer Service)
Fax: (256) 845-6477
(800) 298-4345 (Parts Orders only)

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NOMENCLATURE



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QUICK REFERENCE PARTS GUIDE

DESCRIPTION	PART NO.	SEAL KIT NO.
CYLINDERS:		
EJECTOR – 18 YD BODY	1-6463	272-4881
EJECTOR – 20 YD BODY	1-6464	272-4881
EJECTOR – 25 YD BODY	1-6427	272-4880
EJECTOR – 27 YD BODY	1-6426	272-4880
EJECTOR – 32 YD BODY	1-6421	272-4884
OUTSIDE (upper panel)	1-6610	1-6610-007
INSIDE (lower panel)	1-6611	1-6611-004
TAILGATE RAISE	1-4880	272-0938
ROLL BAR	1-4105	272-0958
REEVING	1-6061	272-0989
ARM MECHANISM	1-4283	272-0966
VALVES:		
UNDERBODY	31-3285	31-3285-48
MAIN RELIEF (set @ 2500 PSI)	31-2979	
INLET	31-3285-01	207-6103
VALVE SECTIONS		
EJECTOR	31-3285-02	31-3285-41, 31-3285-26, 31-2940-06
TAILGATE	31-3285-04	31-32385-41, 31-3285-26, 31-2940-06
TAILGATE (SECONDARY)	31-6269-02,03 or 04	
BLADE BACK-OFF RELIEF (set @ 3900 PSI)	31-3245-08	
AUX. PORT RELIEF (set @ 1400 PSI)	31-3242	
VALVE SECTIONS		
TAILGATE	31-3544-06	272-3861 (spool)
ARM, WINCH,ROLLBAR,REEVING	31-6267	372-1434 (spool)
EJECTOR UNLOAD	31-6272	
REGENERATIVE	31-6285	
FILTER	75-0912	075-0912-001 (ELEMENT)
12,000 LB. WINCH MOTOR	219-1879	219-1878-21

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SECTION 2 – BODY and ATTACHING PARTS

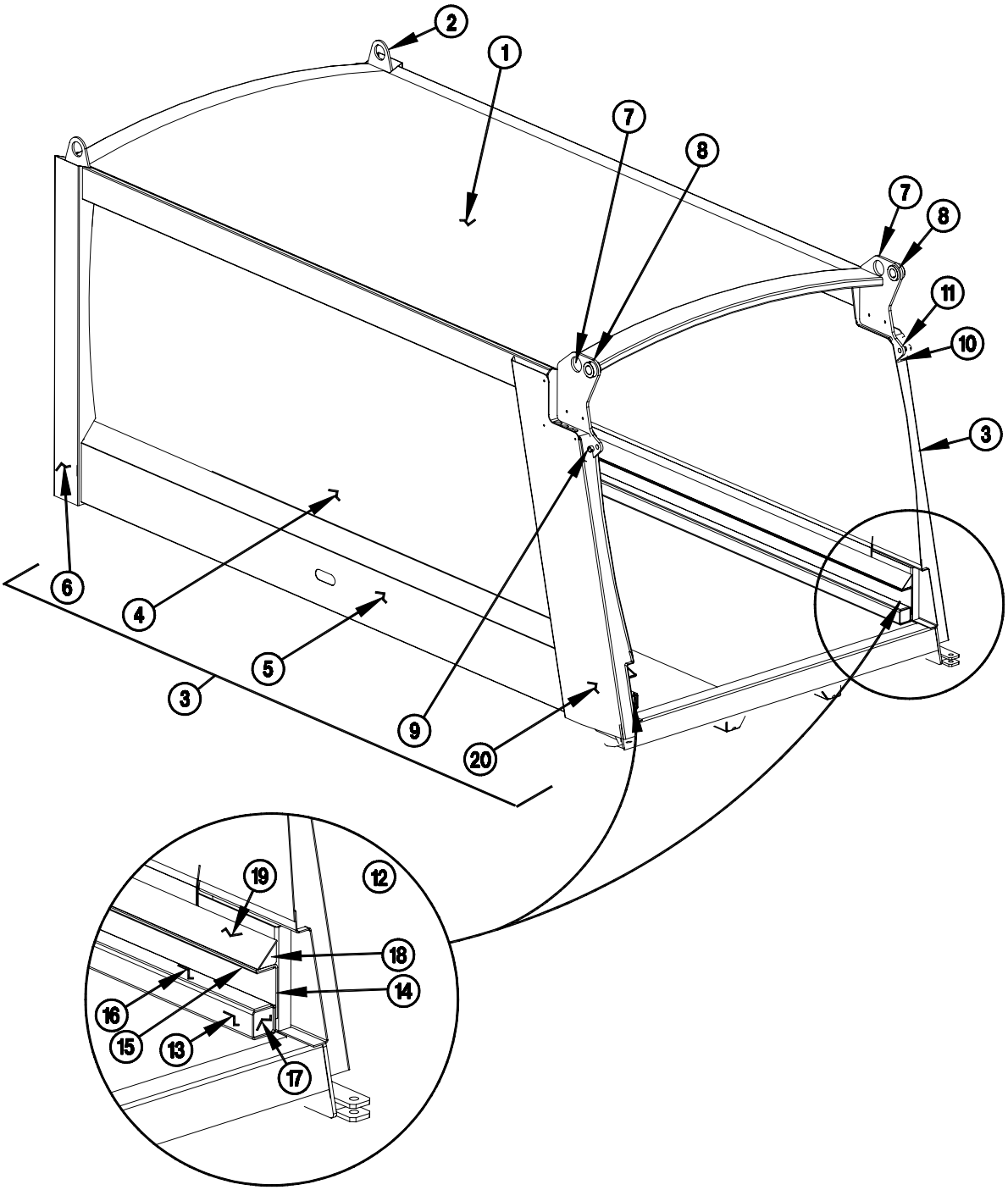
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BODY WELDMENTS – COMMERCIAL BODY

612-2856-18 – 18 YD
612-2856-20 – 20 YD
612-2856-25 – 25 YD
612-2856-27 – 27 YD
612-2856-32 – 32 YD



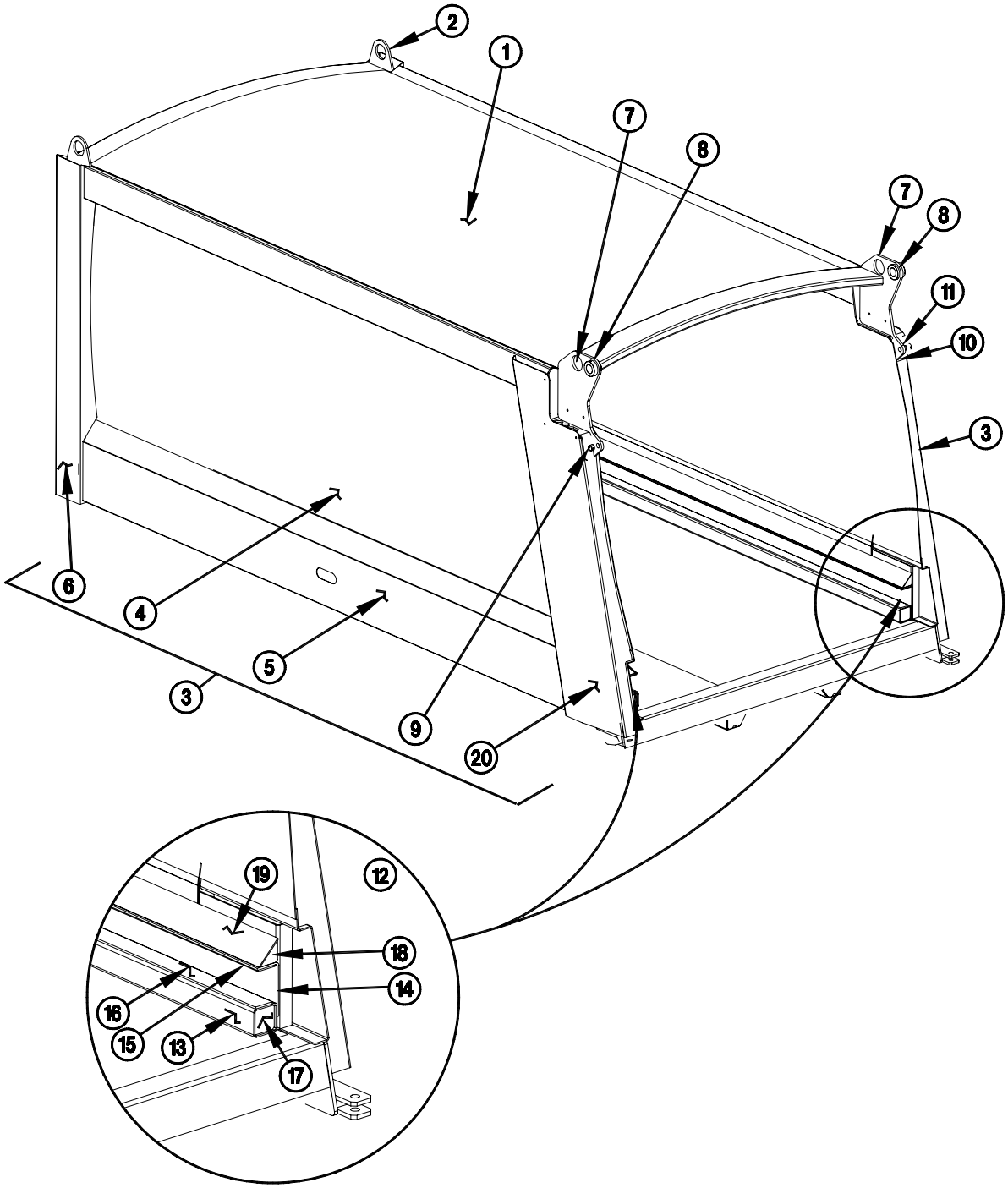
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BODY WELDMENTS – COMMERCIAL BODY
612-2856-18 – 18 YD
612-2856-20 – 20 YD
612-2856-25 – 25 YD
612-2856-27 – 27 YD
612-2856-32 – 32 YD

REF	PART NO.	DESCRIPTION	REQ'D
1	113-0856-18-SER	ROOF WELDMENT – 18 yd. body	1
	113-2996-SER	ROOF WELDMENT – 20 yd. body	1
	113-0860-SER	ROOF WELDMENT – 25 yd. body	1
	113-1168-SER	ROOF WELDMENT – 27 yd. body	1
	113-1169-SER	ROOF WELDMENT – 32 yd. body	1
2	234-1017	LUG, lift	2
3	113-1240-18-SER	BODY SIDE – WELDMENT – L.H. - 18 yd. body	1
	113-1241-18-SER	BODY SIDE – WELDMENT – R.H. - 18 yd. body	1
	113-1240-20-SER	BODY SIDE – WELDMENT – L.H. – 20 yd. body	1
	113-1241-20-SER	BODY SIDE – WELDMENT – R.H. – 20 yd. body	1
	113-1240-25-SER	BODY SIDE – WELDMENT – L.H. – 25 yd. body	1
	113-1241-25-SER	BODY SIDE – WELDMENT – R.H. – 25 yd. body	1
	113-1240-27-SER	BODY SIDE – WELDMENT – L.H. – 27 yd. body	1
	113-1241-27-SER	BODY SIDE – WELDMENT – R.H. – 27 yd. body	1
	113-1240-32-SER	BODY SIDE – WELDMENT – L.H. – 32 yd. body	1
	113-1241-32-SER	BODY SIDE – WELDMENT – R.H. – 32 yd. body	1
4	113-1230-18	SIDE, sheet – L.H. – 18 yd. body	1
	113-1231-18	SIDE, sheet – R.H. – 18 yd. body	1
	113-1230-20	SIDE, sheet – L.H. – 20 yd. body	1
	113-1231-20	SIDE, sheet – R.H. – 20 yd. body	1
	113-1230-25	SIDE, sheet – L.H. – 25 yd. body	1
	113-1231-25	SIDE, sheet – R.H. – 25 yd. body	1
	113-1230-27	SIDE, sheet – L.H. – 27 yd. body	1
	113-1231-27	SIDE, sheet – R.H. – 27 yd. body	1
	113-1230-32	SIDE, sheet – L.H. – 32 yd. body	1
	113-1231-32	SIDE, sheet – R.H. – 32 yd. body	1
5	137-0402-18	SKIRT, lower – outer – 18 yd. body	2
	137-0402-20	SKIRT, lower – outer – 20 yd. body	2
	137-0402-25	SKIRT, lower – outer – 25 yd. body	2
	137-0402-27	SKIRT, lower – outer – 27 yd. body	2
	137-0402-32	SKIRT, lower – outer – 32 yd. body	2
6	137-0403	BOLSTER, front – L.H.	1
	137-0404	BOLSTER, front – R.H.	1
7	234-1019	PLATE, tailgate hinge	2
8	3-4812	BEARING	2
9	40-2205	RETAINER, tailgate cylinder pin	2
10	311-0902	BRACKET, tailgate hinge – L.H.	1
	311-0903	BRACKET, tailgate hinge – R.H.	1
11	234-1018	PLATE, tailgate hinge	2

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BODY WELDMENTS
612-2856-18 – 18 YD
612-2856-20 – 20 YD
612-2856-25 – 25 YD
612-2856-27 – 27 YD
612-2856-32 – 32 YD



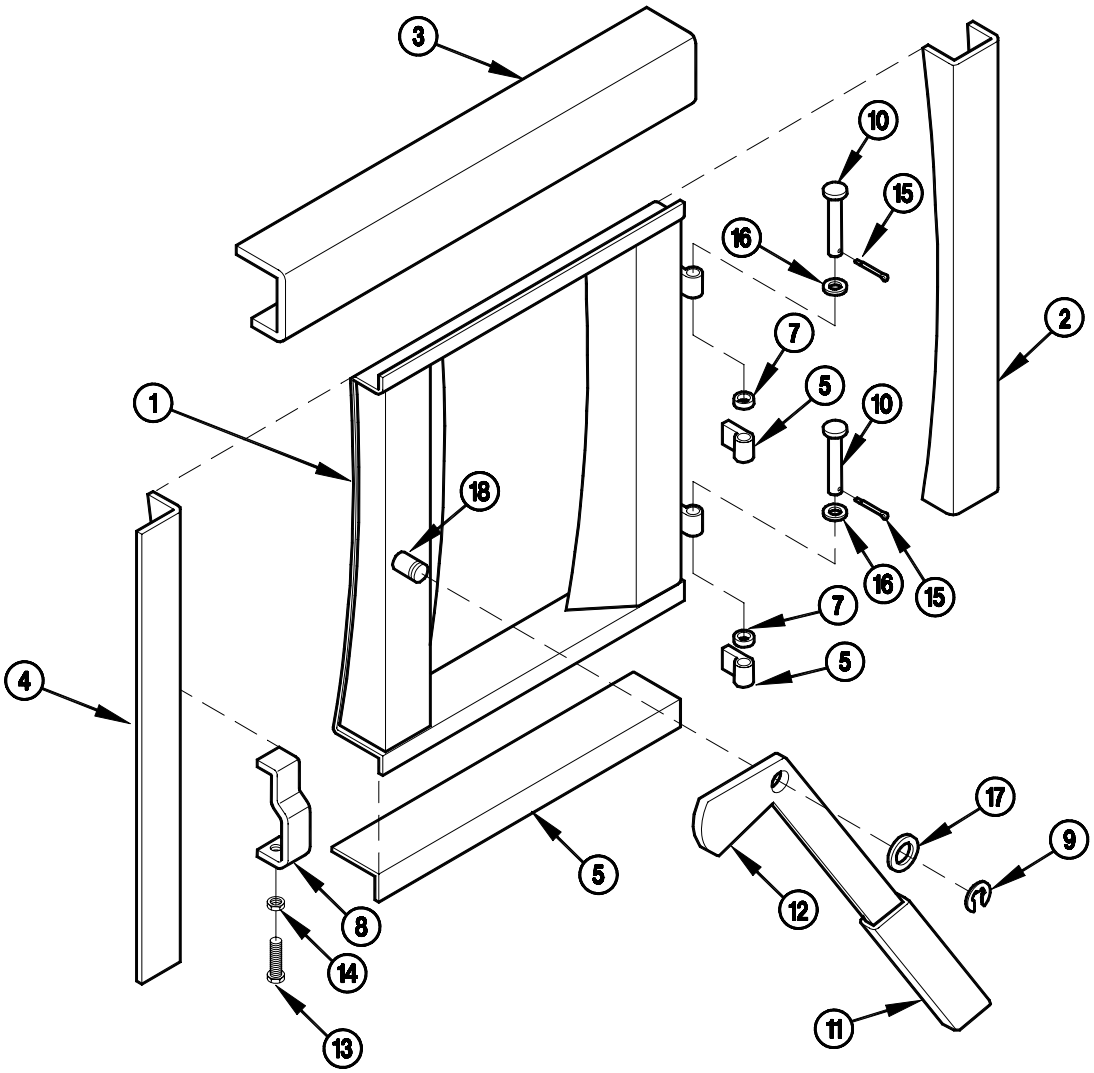
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BODY WELDMENTS
612-2856-18 – 18 YD
612-2856-20 – 20 YD
612-2856-25 – 25 YD
612-2856-27 – 27 YD
612-2856-32 – 32 YD

REF	PART NO.	DESCRIPTION	REQ'D
12	064-3500	GUIDE TRACK – WELDMENT – L.H. – 18 yd body	1
	064-3501	GUIDE TRACK – WELDMENT – R.H. – 18 yd body	1
	064-3502	GUIDE TRACK – WELDMENT – L.H. – 20 yd body	1
	064-3503	GUIDE TRACK – WELDMENT – R.H. – 20 yd body	1
	064-3535	GUIDE TRACK – WELDMENT – L.H. – 25 yd body	1
	064-3536	GUIDE TRACK – WELDMENT – R.H. – 25 yd body	1
	064-3506	GUIDE TRACK – WELDMENT – L.H. – 27 yd body	1
	064-3507	GUIDE TRACK – WELDMENT – R.H. – 27 yd body	1
	064-3508	GUIDE TRACK – WELDMENT – L.H. – 32 yd body	1
	064-3509	GUIDE TRACK – WELDMENT – R.H. – 32 yd body	1
13	126-4898-018	TUBE – 18 yd body	2
	126-4898-020	TUBE – 20 yd body	2
	126-4898-025	TUBE – 25 yd body	2
	126-4898-027	TUBE – 27 yd body	2
	126-4898-032	TUBE – 32 yd body	2
14	177-4273-018	ANGLE – 18 yd body	2
	177-4273-020	ANGLE – 20 yd body	2
	177-4273-025	ANGLE –25 yd body	2
	177-4273-027	ANGLE – 27 yd body	2
	177-4273-032	ANGLE – 32 yd body	2
15	234-1012-018	PLATE, wear – upper – 18 yd body	2
	234-1012-020	PLATE, wear – upper – 20 yd body	2
	234-1012-025	PLATE, wear – upper – 25 yd body	2
	234-1012-027	PLATE, wear – upper – 27 yd body	2
	234-1012-032	PLATE, wear – upper – 32 yd body	2
16	234-1013-018	PLATE, wear – lower – 18 yd body	2
	234-1013-020	PLATE, wear – lower – 20 yd body	2
	234-1013-025	PLATE, wear – lower – 25 yd body	2
	234-1013-027	PLATE, wear – lower – 27 yd body	2
	234-1013-032	PLATE, wear – lower – 32 yd body	2
17	234-1014	PLATE, closure	2
18	234-1024	PLATE, closure	2
19	234-1028-018	PLATE, track reinforcement – 18 yd body	2
	234-1028-020	PLATE, track reinforcement – 20 yd body	2
	234-1028-025	PLATE, track reinforcement – 25 yd body	2
	234-1028-027	PLATE, track reinforcement – 27 yd body	2
	234-1028-032	PLATE, track reinforcement – 32 yd body	2
20	137-0479	BOLSTER, rear – L.H. - (replaces 137-0405)	1
	137-0480	BOLSTER, rear – R. H. - (replaces 137-0406)	1

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SIDE DOOR KIT
272-9046



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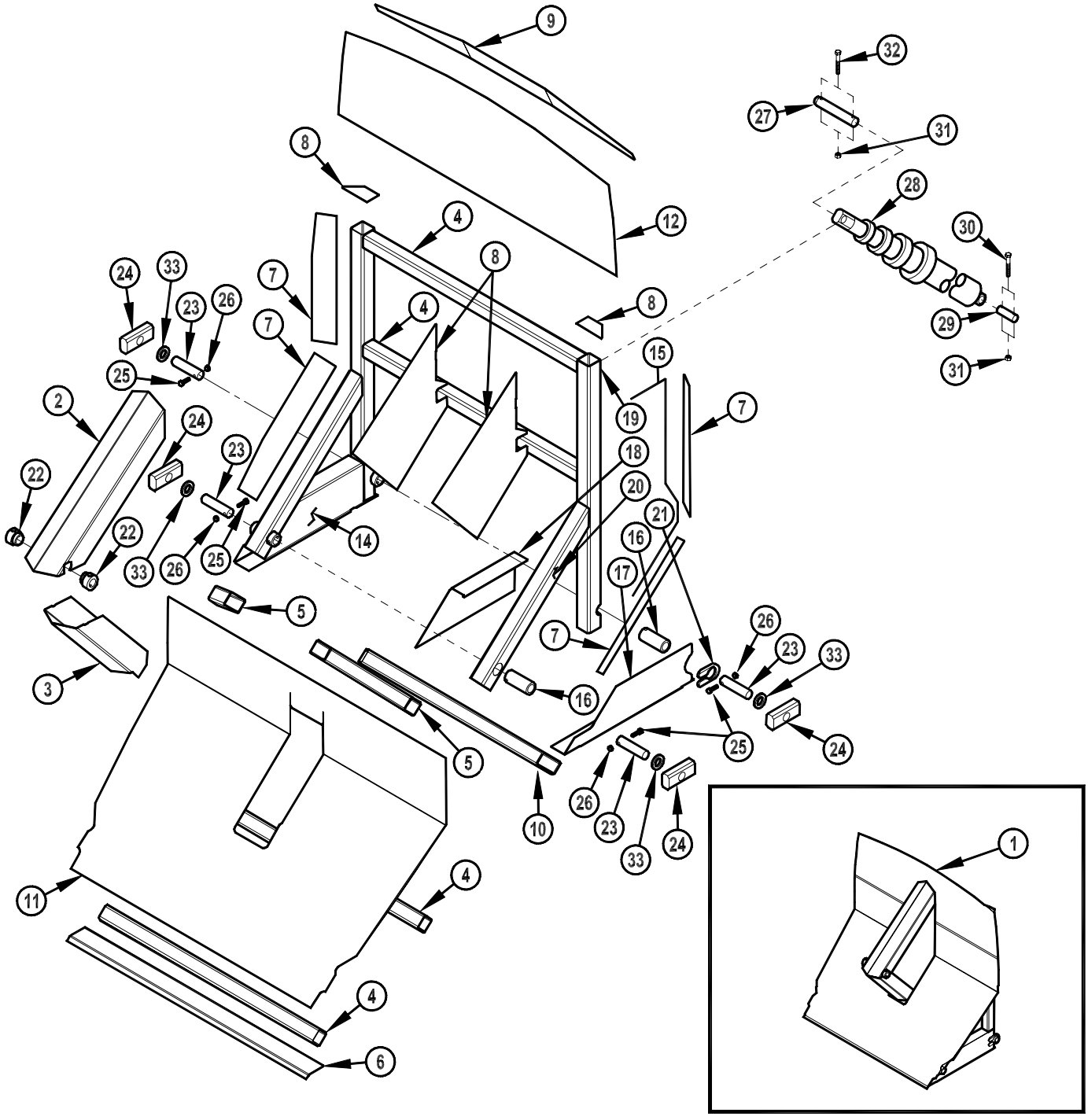
FORMULA 5000

SIDE DOOR KIT
272-9046

REF	PART NO.	DESCRIPTION	REQ'D
1	113-1261-SER	DOOR, hinged side – weldment	1
2	272-9046-001	BRACE	1
3	272-9046-002	BRACE, upper door	1
4	272-9046-003	BRACE, latch	1
5	272-9046-004	ANGLE, door bottom	1
6	005-3121-005	STRAP, hinge	2
7	015-2274	SPACER	2
8	021-3877	BAR, lock	1
9	026-1654	RING, retainer	1
10	048-3891	PIN, hinge	2
11	070-1451	GRIP, handle	1
12	070-1562	HANDLE	1
13	047-2395	CAPSCREW – 3/8" – 16NC x 2"	1
14	FS290900	NUT, jam – 3/8" – 16NC	1
15	FS340420	PIN, cotter – 1/8" x 1"	2
16	FS521100	WASHER, flat – 1/2" SAE	2
17	FS521500	WASHER, flat – 3/4" SAE	1

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EJECTOR PANEL ASSEMBLY and PARTS
237-8172



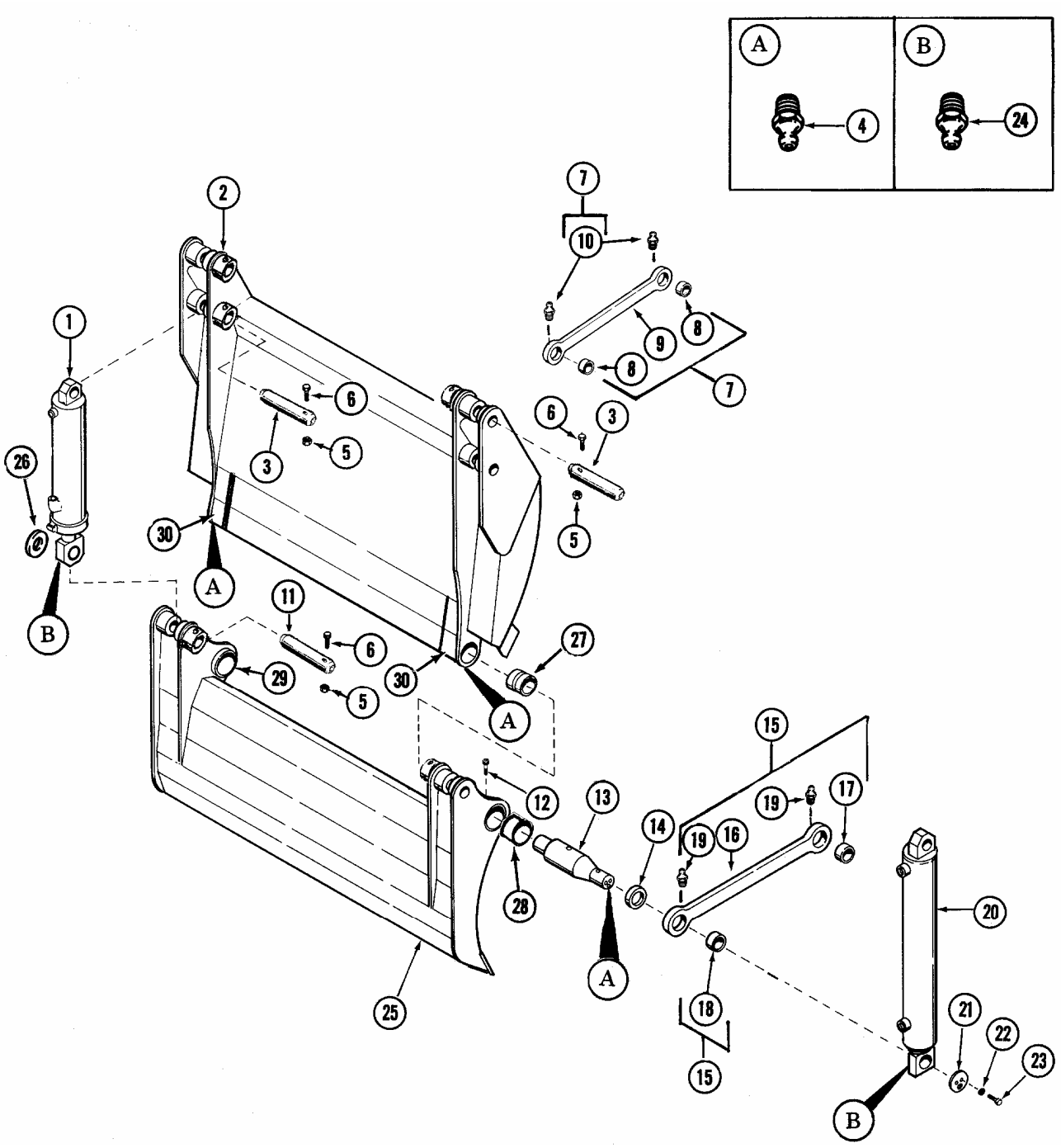
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EJECTOR PANEL ASSEMBLY and PARTS
237-8172

REF	PART NO.	DESCRIPTION	REQ'D
1	237-8171-SER	EJECTOR PANEL – WELDMENT	1
2	126-5729	BRACE	1
3	126-5730	BRACE	1
4	126-5745	BRACE	4
5	126-5746	BRACE	2
6	126-5747	BRACE, lower edge	1
7	126-5750	SUPPORT, face sheet	4
8	126-5751	BRACE, cap	2
9	126-5766	CLOSURE, top	1
10	126-5786	BRACE	1
11	137-0459	SHEET, face - lower	1
12	137-0460	SHEET, face – upper	1
13	234-1419	PLATE	2
14	311-1157-SER	BRACKET, ejector – left hand (includes items 16-20)	1
15	311-1158-SER	BRACKET, ejector – right hand	1
16	040-2602	COLLAR	2
17	126-5723	PLATE, outer support – left hand bracket	1
	126-5724	PLATE, outer support – right hand bracket	1
18	126-5725	PLATE, inner support – left hand bracket	1
	126-5726	PLATE, inner support – right hand bracket	1
19	126-5727	BRACE	1
20	126-5728	BRACKET	1
21	234-1476	PLATE, boss reinforcing	1
22	003-4738	BOSS, ejector cylinder	2
23	048-6271	PIN, ejector shoe	4
24	028-0358	SHOE, blade	4
25	FS101144	CAPSCREW – 1/2" – 20NF x 3-1/2"	4
26	FS241100	NUT, self locking – 1/2" – 20NF	4
27	048-6270	PIN, ejector cylinder base end	1
28	REF.	CYLINDER, ejector (see section 5)	1
29	048-7134	PIN, ejector cylinder rod end	1
30	FS071140	CAPSCREW – 1/2" – 13NC x 3"	2
31	FS231100	NUT, lock – 1/2" – 13NC	3
32	FS071144	CAPSCREW – 1/2" – 13NC x 3-1/2"	1
33	055-1119-001	WASHER	4

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BLADE and UPPER PANEL with ATTACHING PARTS



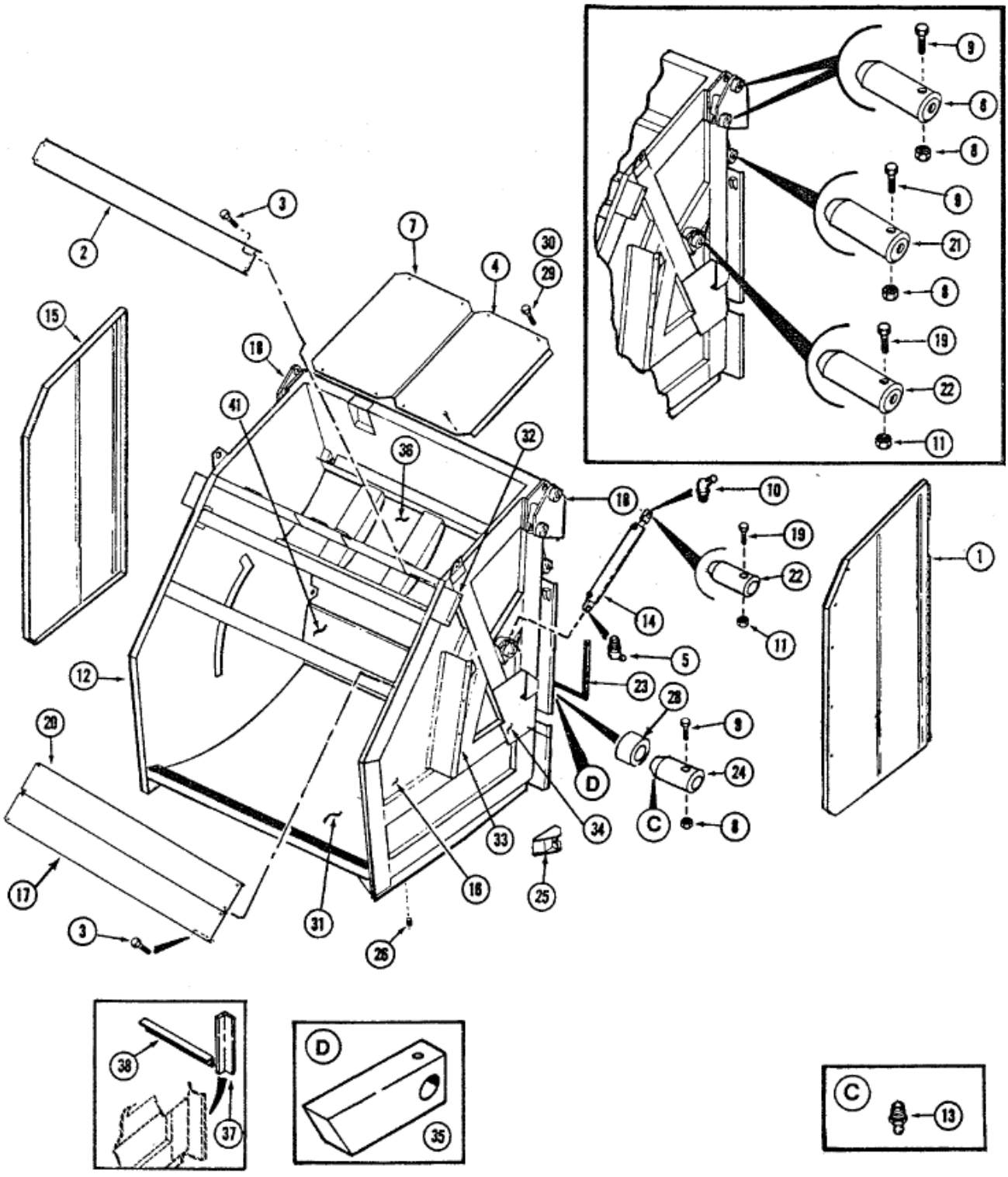
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BLADE and UPPER PANEL with ATTACHING PARTS

REF	PART NO.	DESCRIPTION	REQ'D
1	REF.	CYLINDER, inside – (see section 5)	2
2	134-8091-SER	PANEL ASSEMBLY, upper	1
3	048-5474-093	PIN	4
4	230-0001-006	FITTING, grease – 1/8" NPT x straight	6
5	FS241100	NUT, lock – 1/2" – 20NF	6
6	FS101144	CAPSCREW – 1/2" - 20NF x 3-1/2"	6
7	005-3750	LINK ASSEMBLY	2
8	003-3587	BEARING	2
9	005-3750-C	LINK	1
10	FS190400	FITTING, grease	2
11	048-5474-081	PIN	2
12	207-2836-003	SCREW, socket head – 7/8" x 1-1/8"	2
13	008-9086	SHAFT	2
14	207-7946	WASHER, internal tooth	2
15	004-1811	LINK ASSEMBLY	2
16	004-1810	LINK	1
17	003-4114	BEARING – (small)	1
18	003-4113	BEARING – (large) 1/8"	1
19	FS190400	FITTING, grease	2
20	REF.	CYLINDER, outside – (see section 5)	2
21	207-2855	RETAINER	2
22	FS541100	WASHER, lock – 1/2"	4
23	FS101122	CAPSCREW – 1/2" – 20NNF x 1-1/4"	4
24	FS190400	FITTING, grease	2
25	234-0600-SER	PANEL ASSEMBLY, lower	1
26	055-1119-001	WASHER	2
27	003-3589	BEARING	2
28	049-0666	SLEEVE – (part of lower panel weldment)	2
29	207-7248	WASHER – (part of lower panel weldment)	2
30	134-7285	BOSS, upper panel – L.H. (part of 134-8091 panel)	1
	134-7286	BOSS, upper panel – R. H. (part of 134-8091 panel)	1

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TAILGATE ASSEMBLY and PARTS



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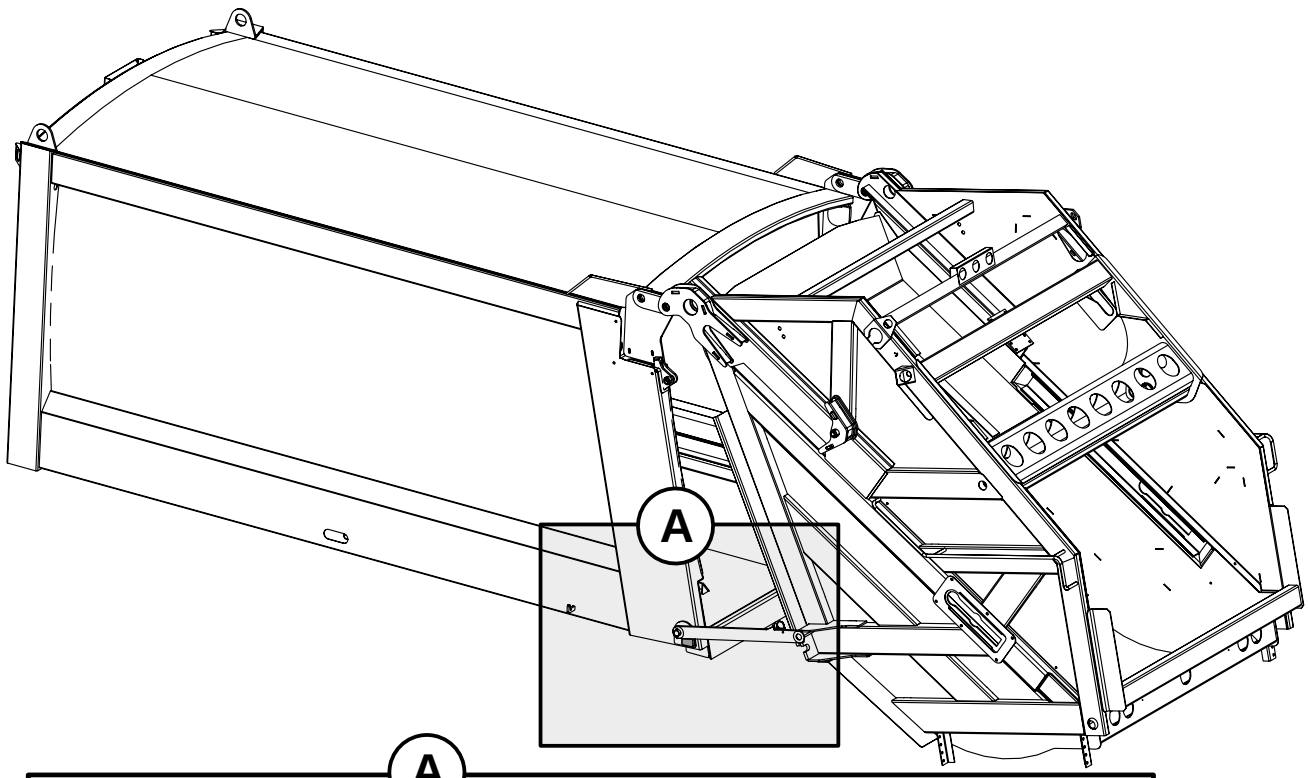
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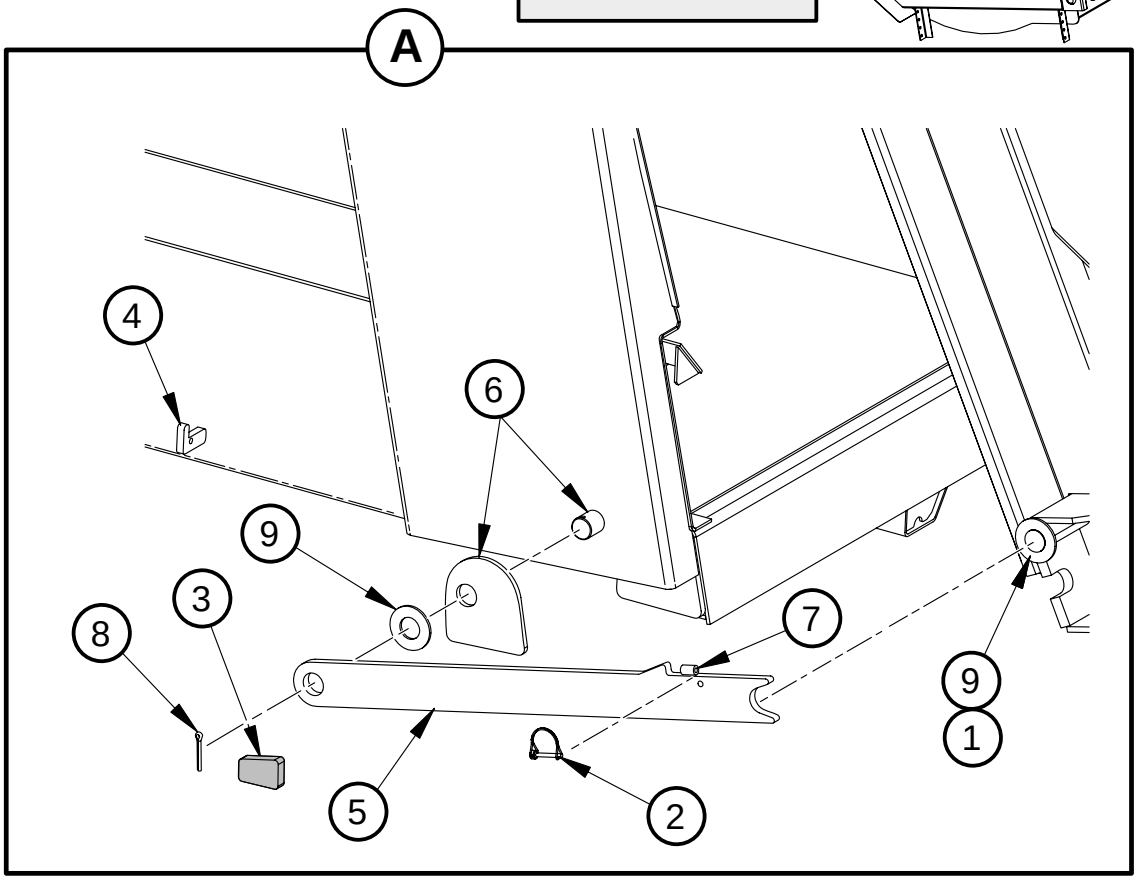
TAILGATE ASSEMBLY and PARTS

REF	PART NO.	DESCRIPTION	REQ'D
1	113-4972-SER	COVER (right hand)	1
2	113-3137	COVER	2
3	FS500715	SCREW, tek – 1/4" x 3/4"	16
4	207-8890	COVER (right hand)	1
5	230-0001-006	FITTING, grease	2
6	048-5476	PIN	4
7	113-0513-002	COVER (left hand)	1
8	FS241100	NUT, lock – 1/2" – 20NF	8
9	FS101144	CAPSCREW – 1/2" – 20NF x 3-1/2"	8
10	230-0001-008	FITTING, grease	2
11	FS240900	NUT, lock – 3/8" – 24NF	4
12	615-5559-SER	TAILGATE WELDMENT	1
13	230-0001-001	FITTING, grease	2
14	REF.	CYLINDER, tailgate raise (see section 5)	2
15	113-4971-SER	COVER (left hand)	1
16	113-1191	SIDE, tailgate – weldment – left hand	1
	113-1192	SIDE, tailgate – weldment – right hand	1
17	211-4120	BRACKET, light mounting	1
18	207-2471	HINGE ASSEMBLY – left hand	1
	207-2472	HINGE ASSEMBLY – right hand	1
19	FS100932	CAPSCREW – 3/8" – 24NF x 2-1/4"	4
20	207-8891	COVER	1
21	048-5474-081	PIN	2
22	048-5474-038	PIN	4
23	022-3118	SEAL, tailgate	1
24	048-5782	PIN	2
25	211-3546	LOCKWELD – right hand	1
	211-3547	LOCKWELD – left hand	1
26	NSS	PLUG, pipe – 1"	1
27	212-1250	HEIL – nameplate – not shown	1
28	040-2201	COLLAR	2
29	FS100813	CAPSCREW – 5/16" – 24NF x 5/8"	4
30	FS540800	WASHER, lock – 5/16"	4
31	094-1438	LINER, hopper bottom with holes (optional)	1
32	211-1665-007	BRACKET	1
33	211-3255	BRACKET – left hand	1
	211-3531	BRACKET – right hand	1
34	211-5736-LH	BRACKET, lower link weldment – left hand	1
	211-5737-RH	BRACKET, lower link weldment – right hand	1
35	211-3424	BRACKET	2
36	134-8163	DEFLECTOR, upper	1
37	177-1059-001	ANGLE, tailgate seal	2
38	177-1059-003	ANGLE, tailgate seal	1

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TAILGATE PROP KIT
372-0703





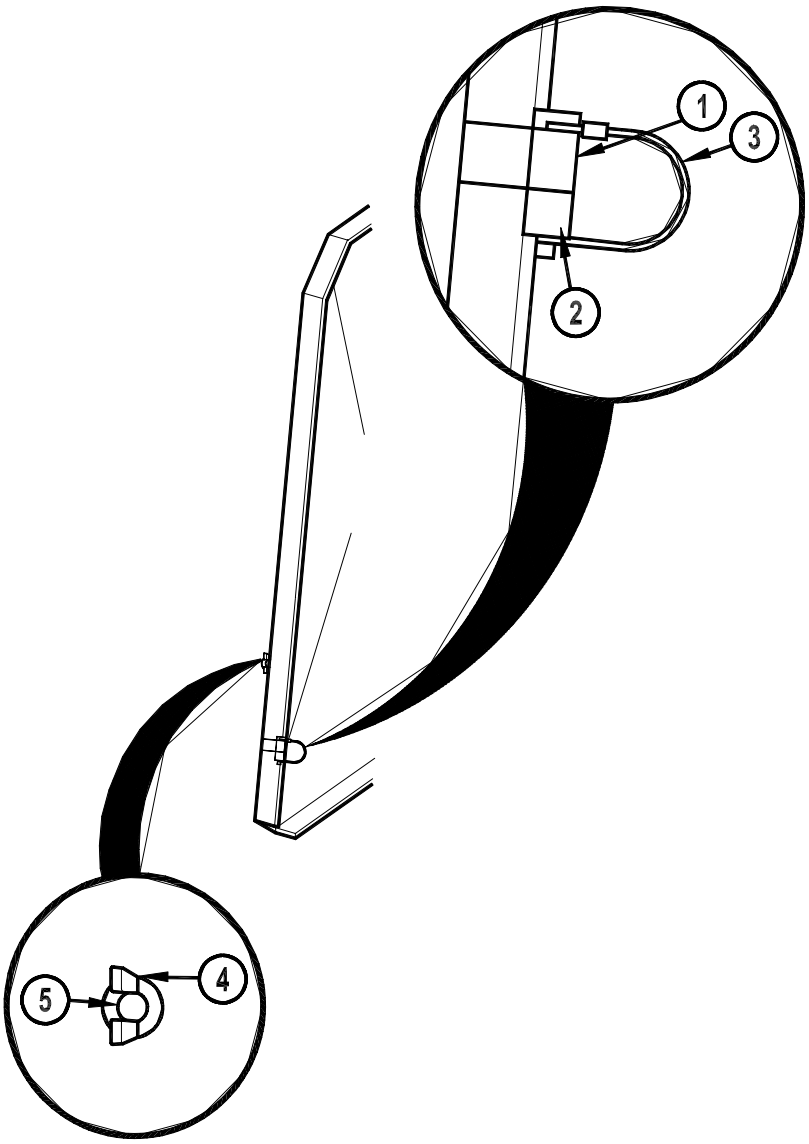
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TAILGATE PROP KIT
372-0703

REF	PART NO.	DESCRIPTION	REQ'D
1	048-7189	PIN	2
2	048-7220	PIN, wire lock	2
3	080-1963	STOP	2
4	080-1964	STOP	2
5	177-3540	SUPPORT	2
6	211-7853	BRACKET, left hand	1
	211-7854	BRACKET, right hand	1
7	354-2102	TUBE	2
8	FS340730	PIN, cotter	2
9	FS522300	WASHER, flat – 1-3/8"	4

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TAILGATE COVER FASTENING PARTS



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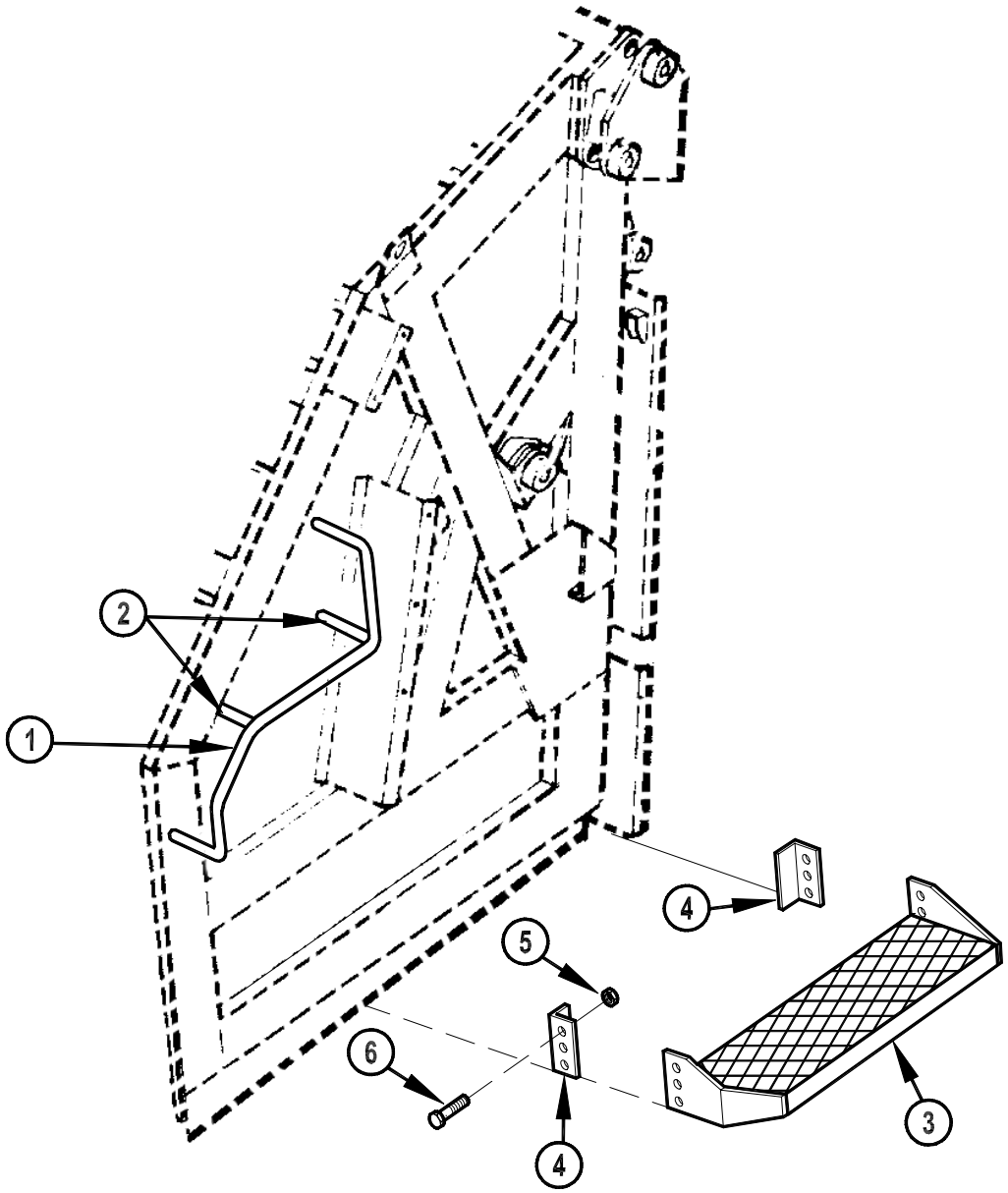
DURAPACK FAMILY 5000

TAILGATE COVER FASTENING PARTS

REF	PART NO.	DESCRIPTION	REQ'D
1	005-3999-001	HINGE	4
2	005-3998	HINGE	4
3	047-2390	PIN, quick release	2
4	047-1791	NUT, wing	2
5	FS420400	SCREW - #10 – 24 x 1/4"	2

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TAILGATE STEP ASSEMBLY



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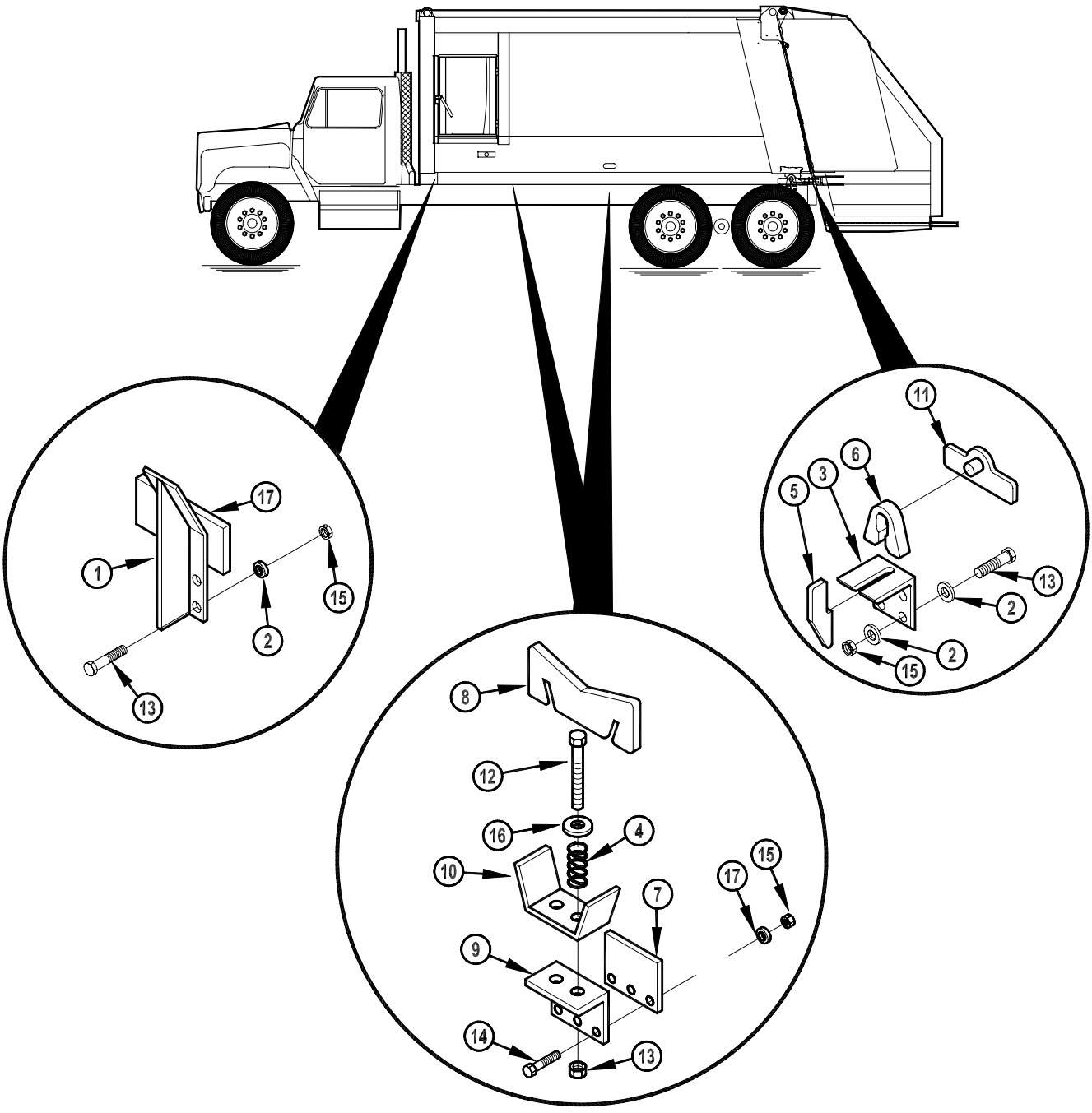
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TAILGATE STEP ASSEMBLY

REF	PART NO.	DESCRIPTION	REQ'D
1	070-1722	HANDLE, grab – left hand	1
	070-1723	HANDLE, grab – right hand	1
2	070-1721	ROD, spacer	2
3	121-2106	STEP WELDMENT – left hand	1
	121-2107	STEP WELDMENT – right hand	1
4	126-4868	BRACKET	2
5	FS231300	NUT, lock – 1/2" – 13NC	6
6	FS071122	CAPSCREW – 1/2" – 13NC x 1-1/4"	6

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BODY TO CHASSIS MOUNTING PARTS



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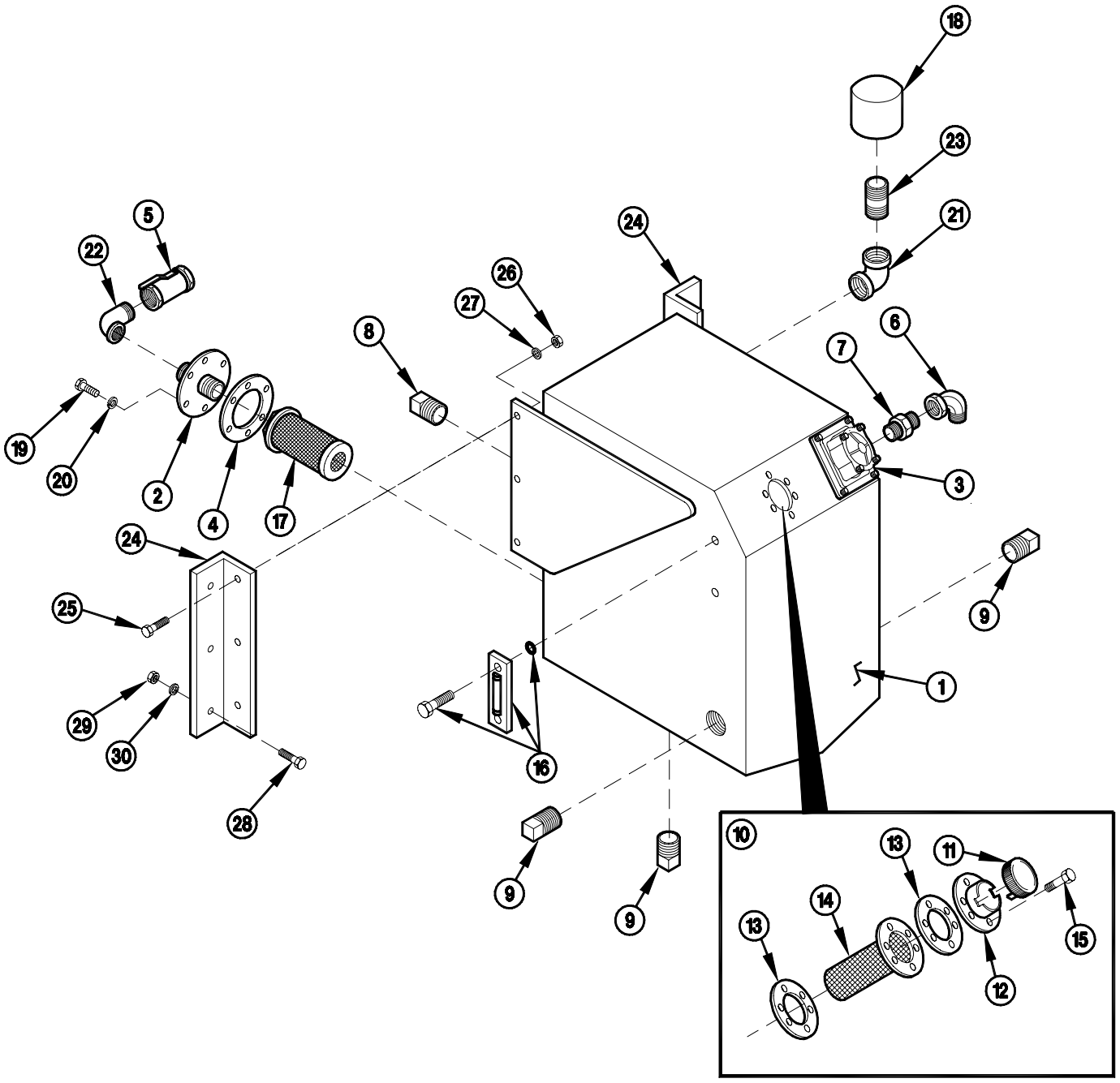
FORMULA 5000

BODY TO CHASSIS MOUNTING PARTS

REF	PART NO.	DESCRIPTION	REQ'D
1	064-3101	GUIDE	2
2	055-1391-007	WASHER, flat – 5/8" SAE	A/R
3	211-5255-001	BRACKET	2
4	019-1242	SPRING	4
5	211-5255-002	BRACE	2
6	211-5255-003	BOSS	2
7	134-7624-001	PLATE	2
8	177-4460	PLATE	2
9	177-1887	SUPPORT	2
10	211-4221	BRACKET	2
11	211-5256	BRACKET, mounting	2
12	FS072070	CAPSCREW – 1" – 8NC x 6"	4
13	FS101334	CAPSCREWE – 5/8" – 18NF x 2-1/2"	A/R
14	FS232000	NUT, lock – 1" – 8NC	A/R
15	FS271300	NUT, hex – 5/8" – 18NF	A/R
16	FS522000	WASHER, flat – 1"	4
17	064-3108	GUIDE	4

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HYDRAULIC OIL TANK with IN-TANK FILTER
WITH 2-1/2" SUCTION
020-2473



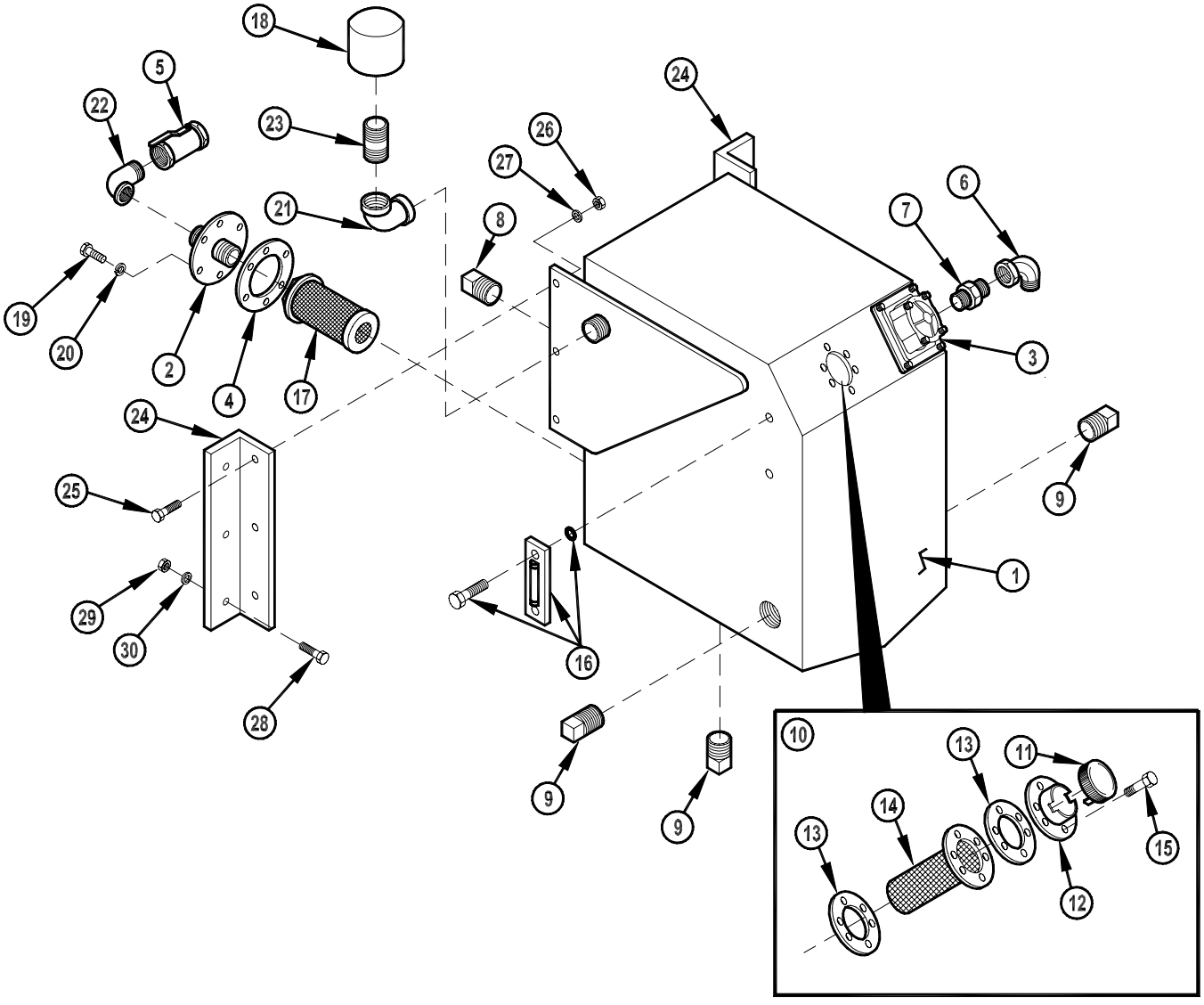
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HYDRAULIC OIL TANK with IN-TANK FILTER WITH 2-1/2" SUCTION 020-2473

REF	PART NO.	DESCRIPTION	REQ'D
1	020-2284	TANK, oil (weldment)	1
2	074-4871	FLANGE	1
3	075-0724	FILTER, oil (see section 5)	1
4	022-2707	SEAL	1
5	031-6286	VALVE, shut-off	1
6	054-2988-010	ELBOW, 90°	1
7	058-3205-026	REDUCER	1
8	054-3342-005	PLUG	1
9	054-3342-010	PLUG	3
10	060-0417	FILL CAP ASSEMBLY	1
11	060-0417-001	CAP	1
12	060-0417-002	FLANGE	1
13	060-0417-003	GASKET	1
14	060-0417-004	STRAINER	1
15	NSS	SCREW, self tapping - #10 – 24	6
16	067-0630	THERMOMETER/SIGHT GAUGE	1
17	075-0896	STRAINER, suction	1
18	075-0712	FILTER/BREATHER – change every time filter is replaced	1
19	FS071120	CAPSCREW – 1/2" – 13NC x 1"	6
20	FS541100	WASHER, lock – 1/2"	6
21	FS781520	ELBOW, 90° reducing	1
22	FS823000	ELBOW, 90° street	1
23	FS881500	NIPPLE, close – 3/4"	1
24	211-4055	BRACKET, tank mounting	2
25	FS071124	CAPSCREW – 1/2" – 13NC x 1-1/2"	6
26	FS231100	NUT, lock – 1/2" – 13NC	6
27	FS521100	WASHER, flat – 1/2"	6
28	FS071334	CAPSCREW – 5/8" – 11NC x 2"	6
29	FS231300	NUT, lock – 5/8" – 11NC	6
30	055-1391-007	WASHER, flat – 5/8" hardened	6

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HYDRAULIC OIL TANK with IN-TANK FILTER
UNITS with PUSHER AXLES
020-2341



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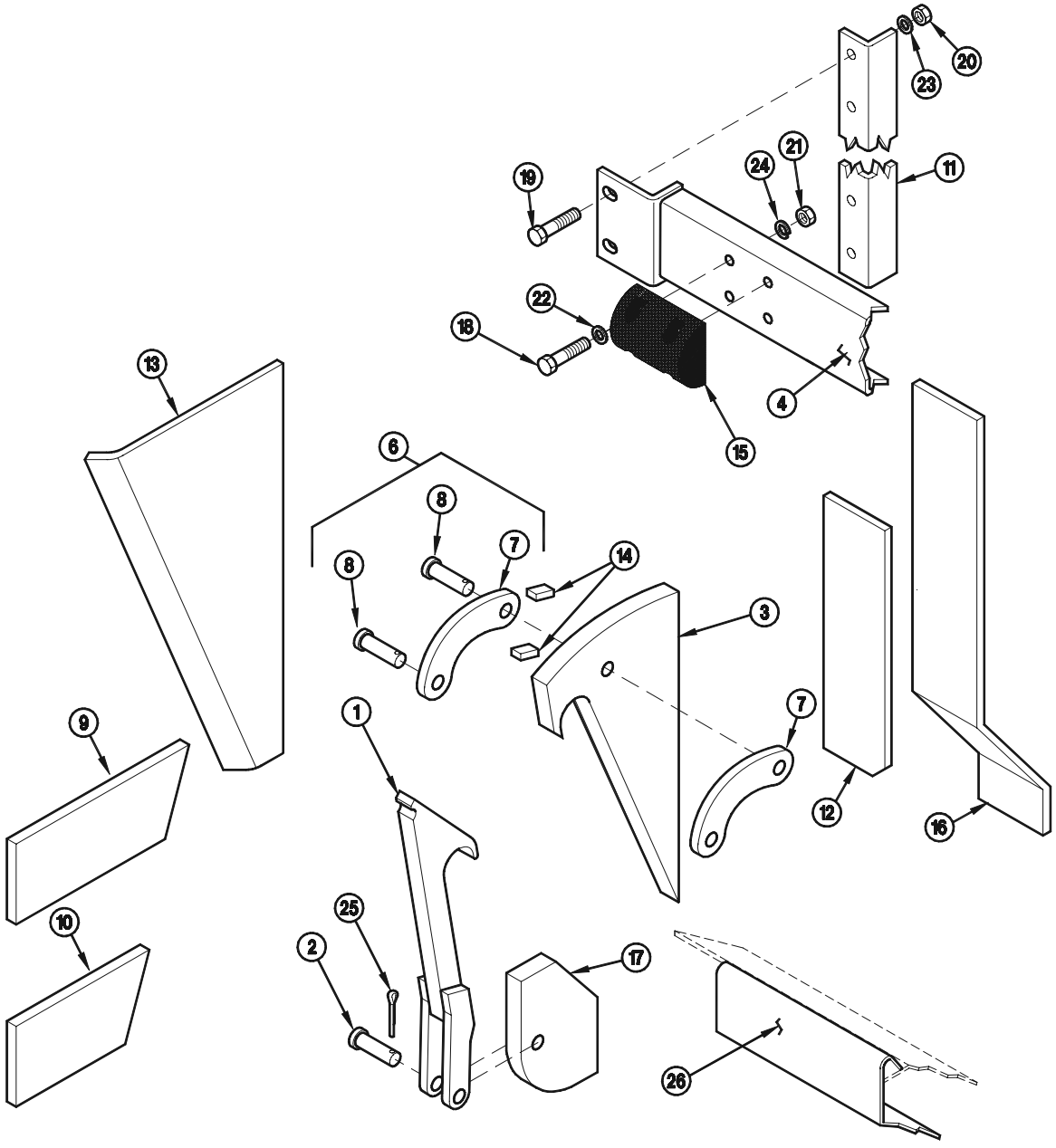
DURAPACK FAMILY 5000

HYDRAULIC OIL TANK with IN-TANK FILTER
UNITS with PUSHER AXLES
020-2341

REF	PART NO.	DESCRIPTION	REQ'D
1	020-2340	TANK, oil (weldment)	1
2	074-3626	FLANGE	1
3	075-0724	FILTER, oil (see section 5)	1
4	022-2707	SEAL	1
5	031-2616	VALVE, shut-off	1
6	054-2988-010	ELBOW, 90°	1
7	058-3205-026	REDUCER	1
8	054-3342-005	PLUG	1
9	054-3342-010	PLUG	3
10	60-0417	FILL CAP ASSEMBLY	1
11	60-0417-001	CAP	1
12	60-0417-002	FLANGE	1
13	60-0417-003	GASKET	1
14	60-0417-004	STRAINER	1
15	NSS	SCREW, self tapping - #10 – 24	6
16	067-0630	THERMOMETER/SIGHT GAUGE	1
17	075-0578	STRAINER, suction	1
18	075-0712	FILTER/BREATHER – change every time filter is replaced	1
19	FS071120	CAPSCREW – 1/2" – 13NC x 1"	6
20	FS541100	WASHER, lock – 1/2"	6
21	FS781520	ELBOW, 90° reducing	1
22	FS823000	ELBOW, 90° street	1
23	FS881500	NIPPLE, close – 3/4"	1
24	211-4055	BRACKET, tank mounting	2
25	FS071124	CAPSCREW – 1/2" – 13NC x 1-1/2"	6
26	FS231100	NUT, lock – 1/2" – 13NC	6
27	FS521100	WASHER, flat – 1/2"	6
28	FS071334	CAPSCREW – 5/8" – 11NC x 2"	6
29	FS231300	NUT, lock – 5/8" – 11NC	6
30	055-1391-007	WASHER, flat – 5/8" hardened	6

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LATCH KITS
272-7999 – STANDARD



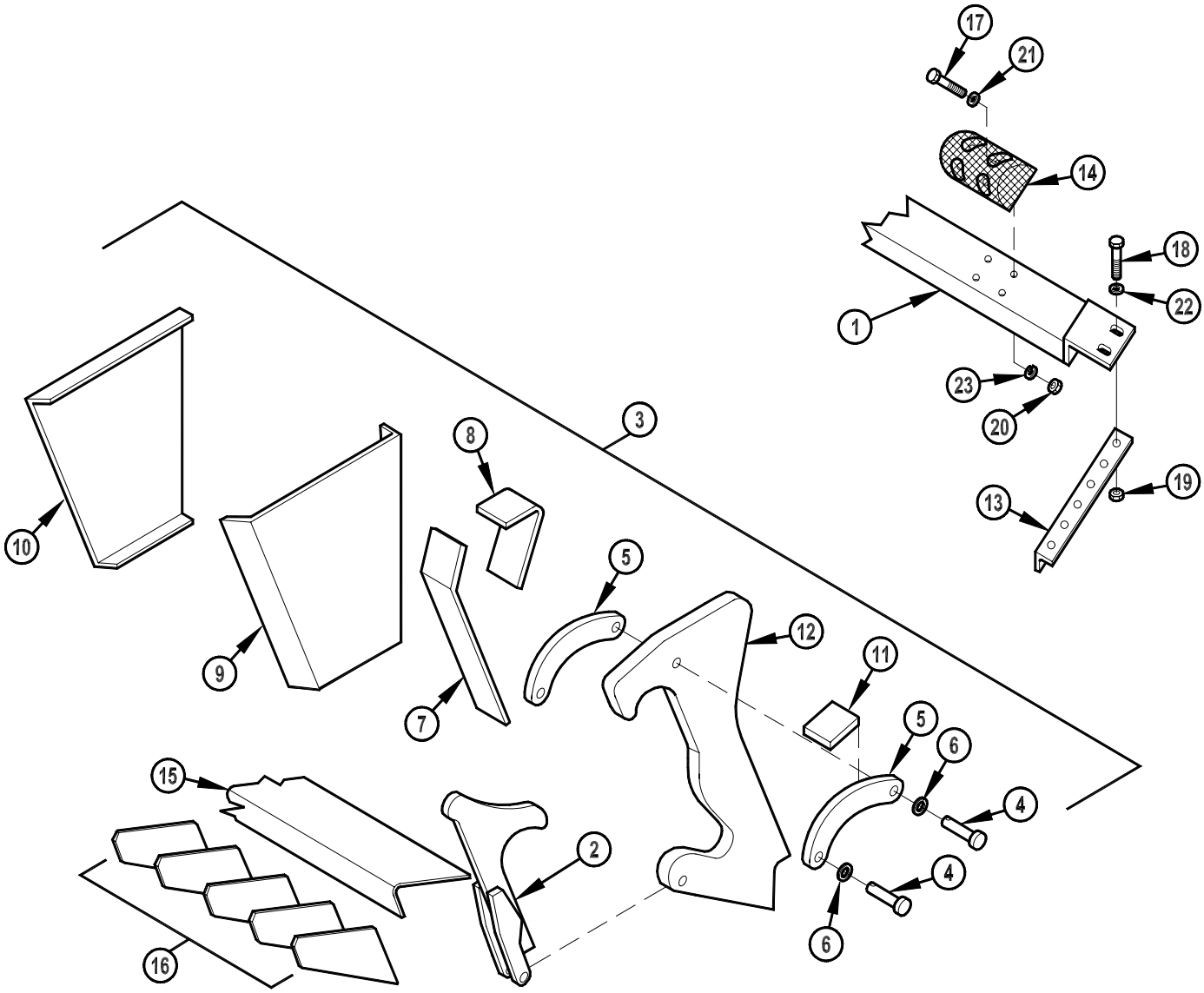
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LATCH KITS
272-7999 – STANDARD

REF	PART NO.	DESCRIPTION	REQ'D
1	311-0628	BAR, latch	2
2	048-3127-011	PIN	2
3	053-2135	PLATE, latch	2
4	134-9084	BAR, bash – adjustable	1
6	053-2235	LATCH ASSEMBLY	2
7	053-2235-001	PLATE, latch	2
8	048-3127-001	PIN	2
9	126-4870	SUPPORT	2
10	126-4869	SUPPORT	2
11	126-3556	BRACE	2
12	126-3918	BRACE	2
13	064-3513	PLATE, guide – left hand	1
	064-3514	PLATE, guide – right hand	1
14	070-1724	STOP	4
15	206-8235	BUMPER, rubber	2
16	211-9977	PLATE, latch	2
17	211-9978	BRACKET, pivot	2
18	FS071040	CAPSCREW – 7/16" – 14NC x 3"	8
19	FS071134	CAPSCREW – 1/2" – 13NC x 2-1/2"	4
20	FS231100	NUT, lock - 1/2" – 13NC	4
21	FS281100	NUT, lock – 7/16" – 14NC	8
22	FS511000	WASHER, flat – 7/16"	8
23	FS511100	WASHER, flat – 1/2"	8
24	FS551000	WASHER, lock – 7/16"	8
25	FS340420	PIN, cotter	2
26	094-2326	SILL, spill	1

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LATCH KITS (20° SLOPE) for
272-9917 - STANDARD MOUNT CART DUMPER
372-2232 – CENTER MOUNTED CART DUMPER
372-3446 – RIGHT HAND MOUNTED CART DUMPER
372-2945 – DUAL MOUNTED CART DUMPERS

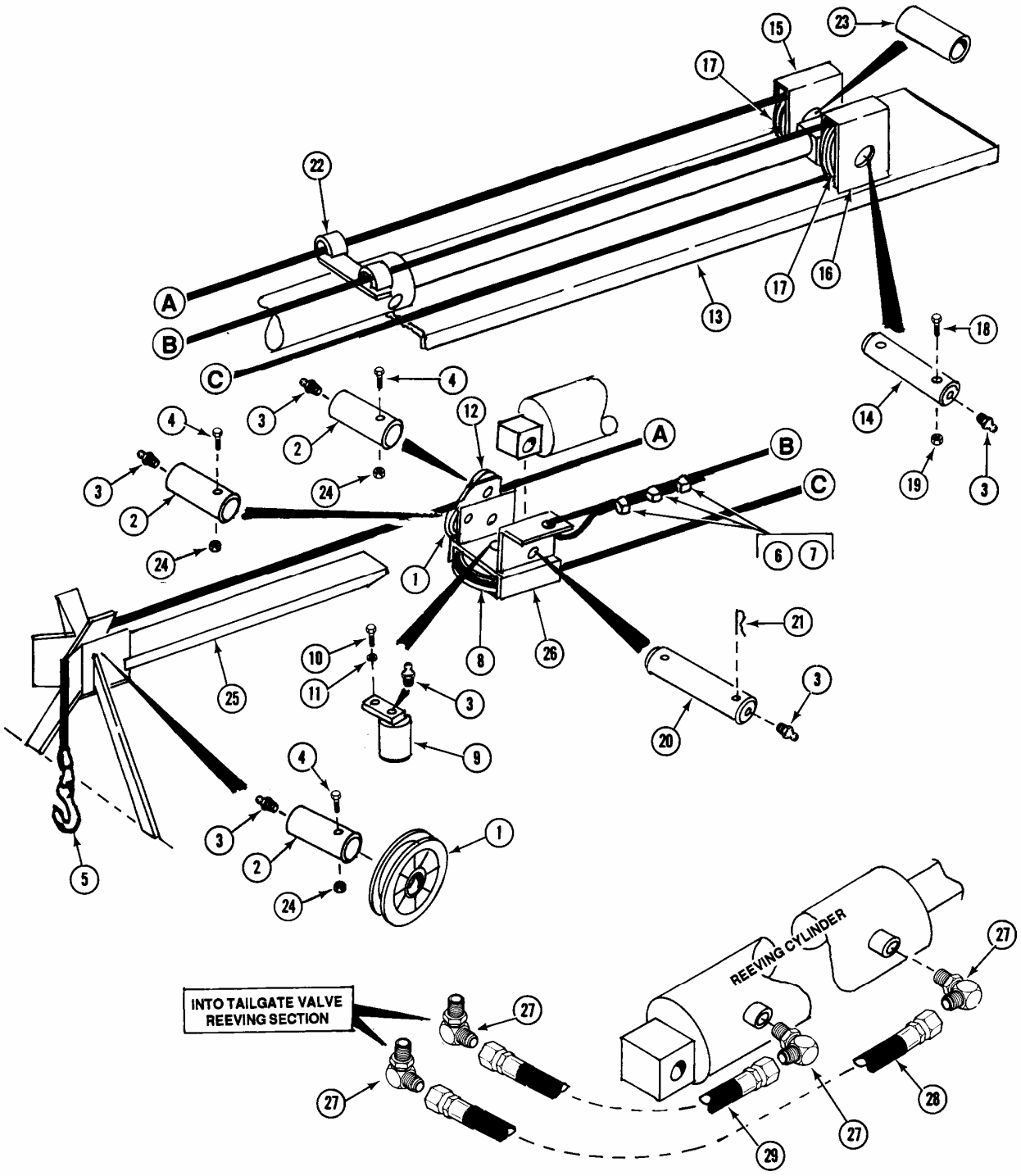


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NOTES and COMMENTS

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REEVING MECHANSIM



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FORMULA 5000

REEVING MECHANSIM

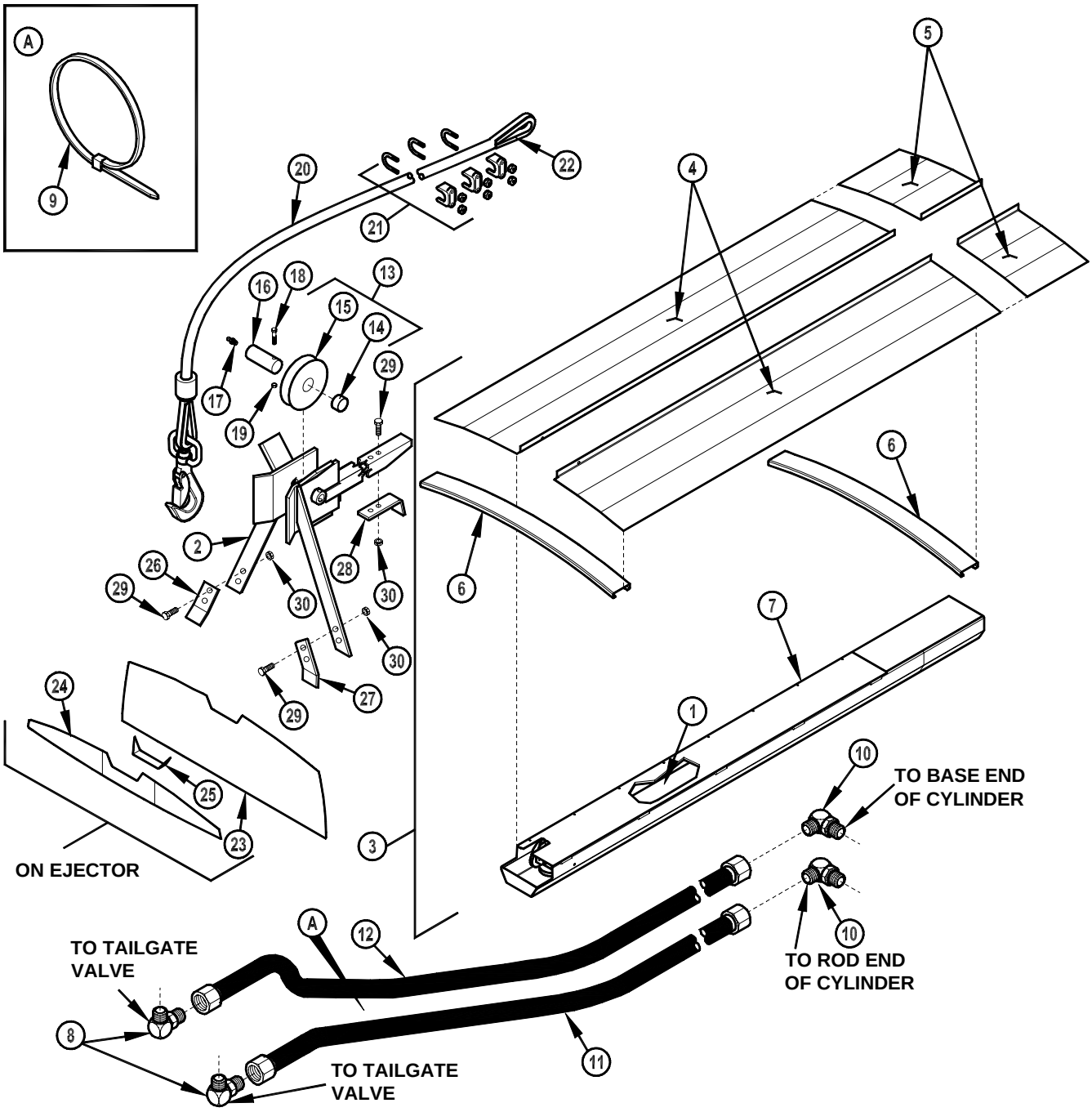
REF	PART NO.	DESCRIPTION	REQ'D
1	072-1555	SHEAVE – 6" x 7/8" bore	2
2	048-5537	PIN	3
3	FS190700	FITTING, grease – 1/4" NPT – 28	6
4	FS070826	CAPSCREW – 5/16" – 18NC x 1-3/4"	3
5	097-0469-054	CABLE & HOOK ASSEMBLY	1
6	097-0465	CLAMP, cable	3
7	097-0453-003	THIMBLE	1
8	072-1556	SHEAVE – 8" x 1-1/2" bore	1
9	211-3134	PIN ASSEMBLY	1
10	FS070913	CAPSCREW – 3/8" – 16NC x 5/8"	1
11	FS540900	WASHER, lock – 3/8"	1
12	072-1558	SHEAVE – 2-1/2" x 7/8" bore	1
13	211-6954-SER	BRACKET – (used on std. mechanism) (includes item 26)	1
	211-7045-SER	BRACKET – (used on recessed mech.) (includes item 26)	1
14	048-5269	PIN	1
15	211-4229	BRACKET (right hand)	1
16	211-4230	BRACKET (left hand)	1
17	072-1557	SHEAVE – 8" x 1-3/4" bore	2
18	FS070934	CAPSCREW – 3/8" – 16NC x 2-1/2"	2
19	FS230900	NUT, lock – 3/8" – 16NC	2
20	048-5403	PIN	1
21	FS340740	PIN, cotter – 1/4" x 3-1/2"	2
22	064-3033	GUIDE	1
23	015-2612	SPACER	1
24	FS230800	NUT, lock – 5/16" – 18NC	3
25	211-3127-SER	BRACKET, tailgate	1
26	211-4223-SER	BRACKET – (weldment)	1
27	054-3237-017	ELBOW, 90° reducing	4
28	QC3-FFFF-139	HOSE, hydraulic – for standard & recessed mech	1
	QC3-FFFF-172	HOSE, hydraulic – for 25 yd recessed mech	1
	QC3-FFFF-230	HOSE, hydraulic – for 32 yd recessed mech	1
29	QC3-FFFF-79	HOSE, hydraulic – for standard mech	1
	QC3-FFFF-87	HOSE, hydraulic – for 20 yd recessed mech	1
	QC3-FFFF-120	HSOE, hydraulic – for 25 yd recessed mech	1
	QC3-FFFF-160	HOSE, hydraulic – for 32 yd recessed mech	1

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RECESSED REEVING MECHANISM
272-9806-025 for 25 YD. UNITS
272-9806-027 for 27 YD. UNITS
272-9806-032 for 32 YD. UNITS

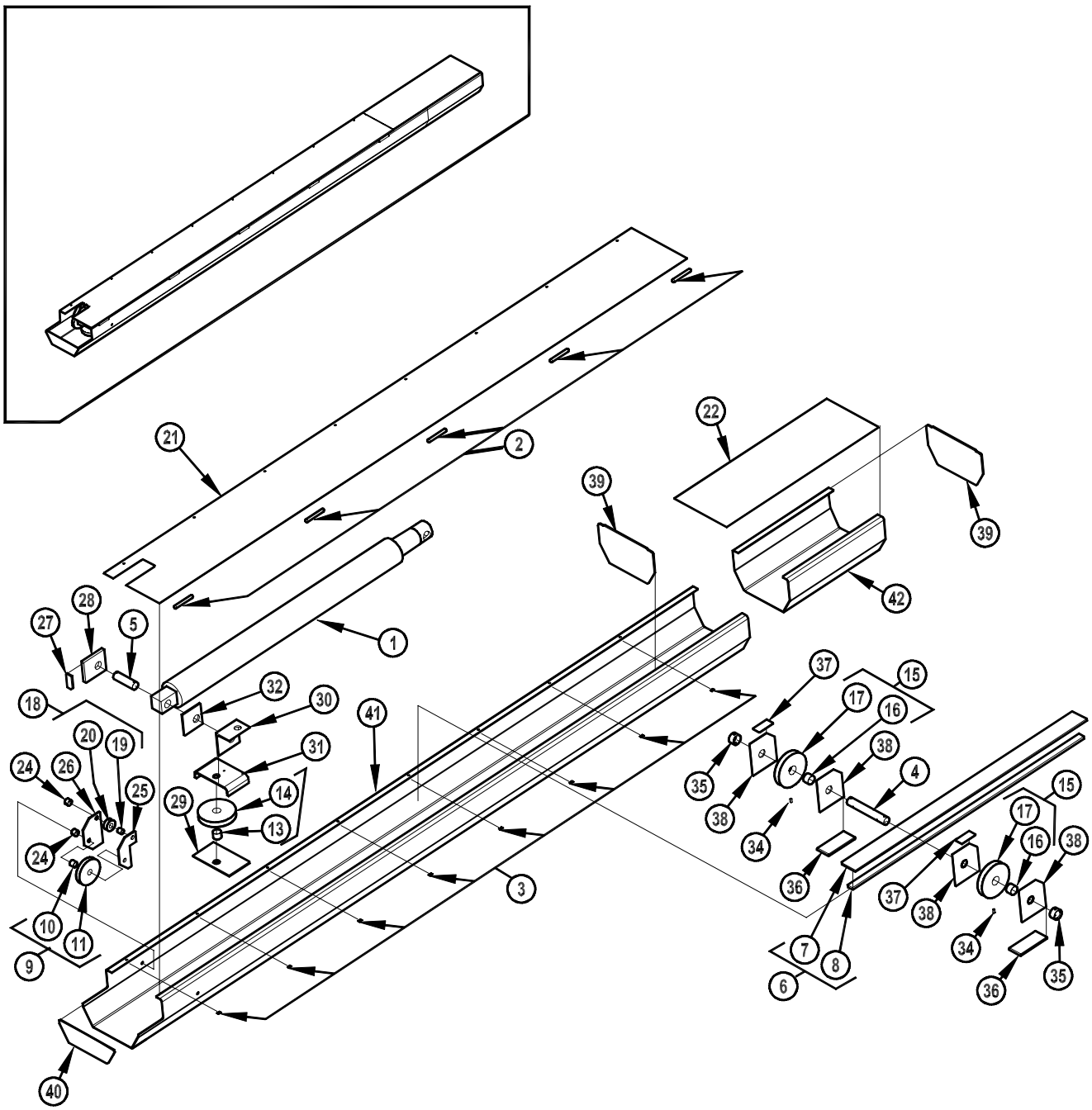


RECESSED REEVING MECHANISM
272-9806-025 for 25 YD. UNITS
272-9806-027 for 27 YD. UNITS
272-9806-032 for 32 YD. UNITS

REF	PART NO.	DESCRIPTION	REQ'D
1	REF.	CYLINDER, reeving (see section 5)	1
2	211-3127	BRACKET	1
3	113-2262-025	ROOF WELDMENT, recess – 25 yd. units	1
	113-2262-027	ROOF WELDMENT, recess – 27 yd. units	1
	113-2262-032	ROOF WELDMENT, recess – 32 yd. units	1
4	113-2050-025	SHEET, roof – left hand – 25 yd units	1
	113-2050-027	SHEET, roof – left hand – 27 & 32 yd units	1
	113-2051-025	SHEET, roof – right hand – 25 yd units	1
	113-2051-027	SHEET, roof – right hand – 27 & 32 yd units	1
5	113-2052	EXTENSION, roof – left hand – 32 yd units	1
	113-2053	EXTENSION, roof – right hand – 32 yd units	1
6	126-4589	TUBE	2
7	253-2385-025-SER	CHANNEL – 25 yd units – see page 2.35	1
	253-2385-027-SER	CHANNEL – 27 yd units – see page 2.35	1
	253-2385-032-SER	CHANNEL – 32 yd units – see page 2.35	1
8	054-3237-017	ELBOW, 90° reducing	2
9	036-1115	TIE, plastic	1
10	054-3664-007	ELBOW, 90°	2
11	QC3-FFFF-079	HOSE, hydraulic	1
12	QC3-FFFF-139	HOSE, hydraulic	1
13	072-1555	SHEAVE ASSEMBLY – 6" OD	1
14	003-4748	BUSHING – bronze	1
15	072-1571	SHEAVE	1
16	048-5537	PIN	1
17	FS190700	FITTING, grease	1
18	FS070826	CAPSCREW – 5/16" – 18NC x 1-3/4"	1
19	FS230800	NUT, lock – 5/16" –18NC	1
20	097-0469-054	ROPE, wire	1
21	097-0465	CLAMP, cable	3
22	097-0453-003	THIMBLE	1
23	137-0475	SHEET, face – upper	1
24	177-4814	BRACE	1
25	234-1600	CLOSURE	1
26	211-9049-001	BRACKET – left hand	1
27	211-9049-002	BRACKET – right hand	1
28	311-1391	BRACKET	1
29	FS071330	CAPSCREW – 5/8" – 11NC x 2"	6
30	FS231300	NUT, lock – 5/8" 1 11NC	6
31	097-0469-002	SLEEVE, swage	1
32	097-0469-003	THIMBLE	1
33	053-1963	HOOK, swivel	1

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REEVING CHANNEL
272-2385-025 for 25 YD. UNITS
272-2385-027 for 27 YD. UNITS
272-2385-032 for 32 YD. UNITS

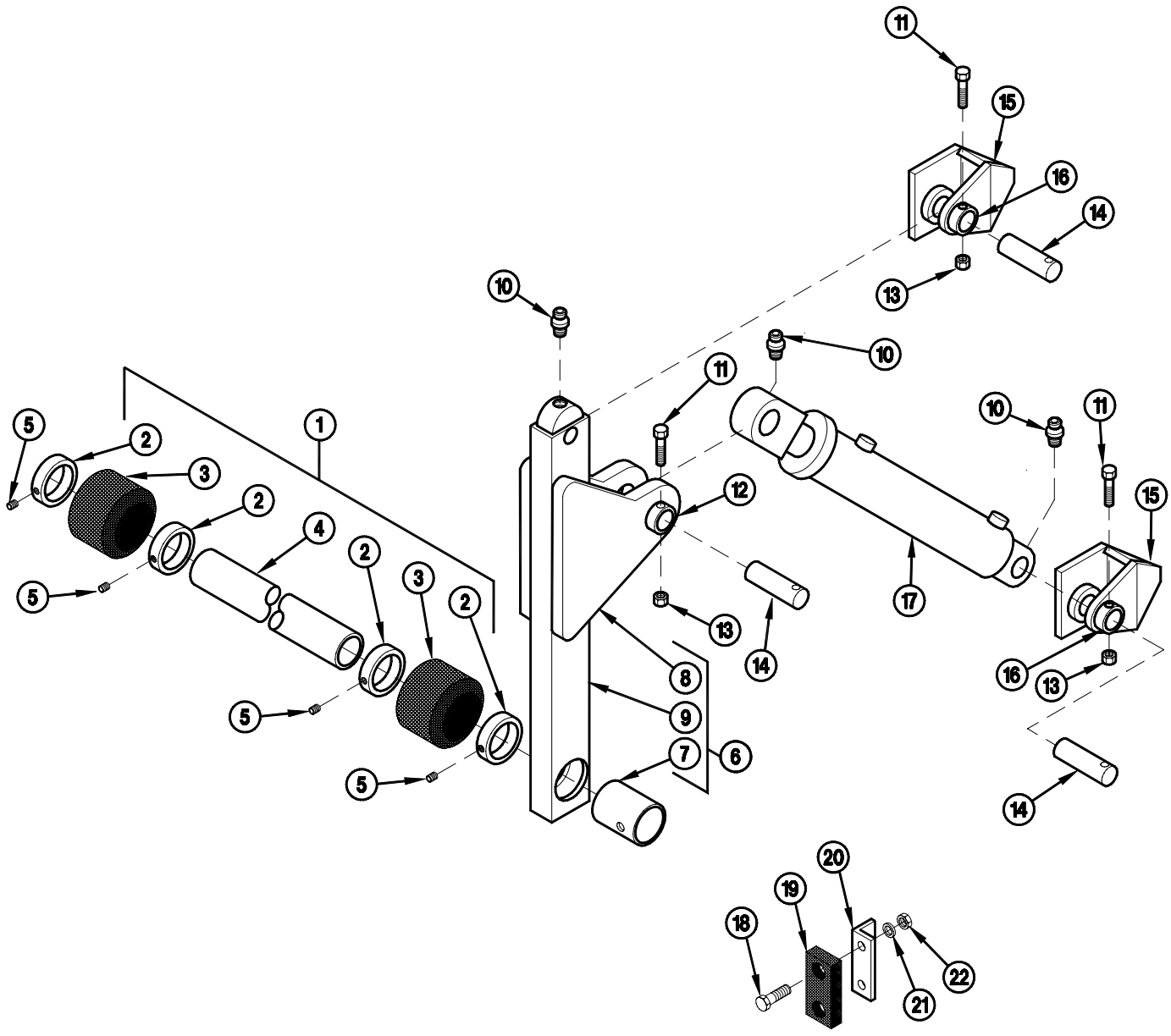


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REEVING CHANNEL
272-2385-025 for 25 YD. UNITS
272-2385-027 for 27 YD. UNITS
272-2385-032 for 32 YD. UNITS

REF	PART NO.	DESCRIPTION	REQ'D
1	REF.	CYLINDER, reeving (see section 5)	1
2	005-4134-008	HINGE	5
3	047-2287	NUT, weld	8
4	048-5269	PIN	1
5	048-5463	PIN	1
6	064-3253	GUIDE	1
7	064-3253-001	PLATE	1
8	064-3253-002	PLATE	1
9	072-1555	SHEAVE ASSEMBLY – 6" O.D.	1
10	003-4748	BUSHING – BRONZE	1
11	072-1571	SHEAVE	1
12	072-1556	SHEAVE ASSEMBLY – 8" O.D. (for 1-1/2" pin)	1
13	003-4749	BUSHING – bronze	1
14	072-1572	SHEAVE	1
15	072-1557	SHEAVE ASSEMBLY – 8" O.D. (for 1-3/4" pin)	2
16	003-4750	BUSHING – bronze	1
17	072-1573	SHEAVE	1
18	072-1558	SHEAVE ASSEMBLY – 2-1/2" O.D.	1
19	003-4213	BUSHING – bronze	1
20	072-1559	SHEAVE	1
21	113-2057	COVER	1
22	113-2058-025	COVER – for 25 yd units	1
	113-2058-027	COVER – for 27 yd units	1
	113-2058-032	COVER – for 32 yd units	1
23	211-4223	BRACKET, cylinder	1
24	040-2220	COLLAR, pin	2
25	126-2825	BRACE	1
26	126-2826	BRACE	1
27	126-2827	BRACE	1
28	211-4224	BRACKET	1
29	211-4227	BRACKET	1
30	311-1392	BRACKET	1
31	311-1393	CHANNEL	1
32	311-1394	PLATE	1
33	211-4229	BRACKET – left hand	1
	211-4230	BRACKET – right hand	1
34	021-3575	BAR	1
35	048-5397	PIN, retainer	1
36	064-3073	GUIDE	1
37	211-4231	BRACKET	1
38	211-4232	BRACKET	2
39	234-1503	PLATE, front	2
40	234-1504	PLATE, rear	1
41	311-1318-025	CHANNEL – 25 yd units	1
	311-1318-027	CHANNEL – 27 & 32 yd units	1

ROLLER BAR MECHANISM with ROLLERS
372-1779



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FORMULA 5000

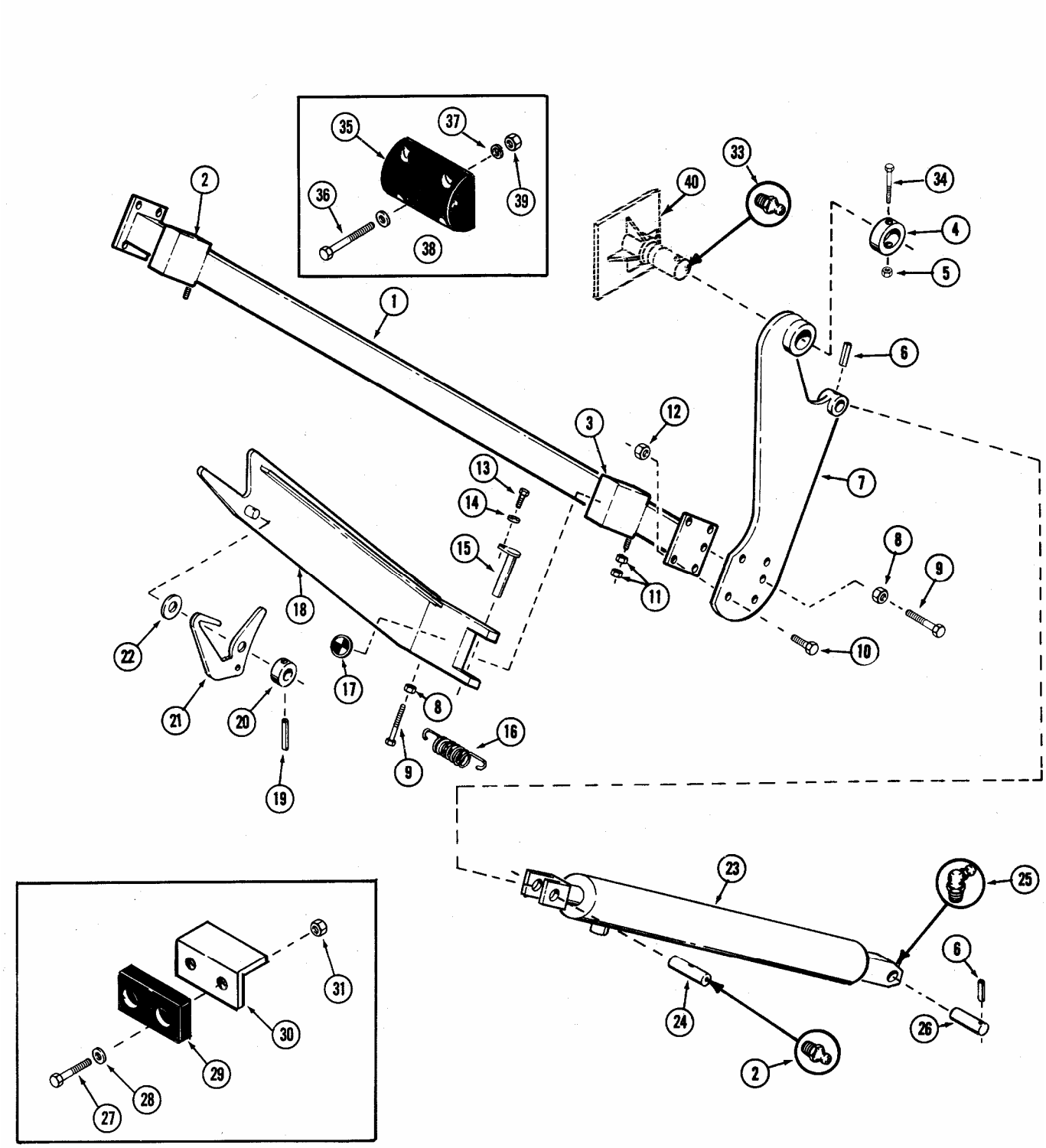
ROLLER BAR MECHANISM with ROLLERS
372-1779

REF	PART NO.	DESCRIPTION	REQ'D
1	054-9525	CROSSTUBE ASSEMBLY	1
2	003-4527	BEARING	4
3	003-4426	BEARING	1
4	054-9526	SHAFT, cross	1
5	047-1088	SETSCREW	4
6	093-2034	ARM, lift – left hand	1
	093-2035	ARM, lift – right hand	1
7	003-4525	BEARING	1
8	207-5185	PLATE	2
9	93-2326	ARM WELDMENT	1
10	FS190400	FITTING, grease – 1/8" NPT x straight	6
11	FS100934	CAPSCREW – 3/8" – 24NF x 2-3/4"	6
12	040-2071	COLLAR, retaining	2
13	FS240900	NUT, lock – 3/8" – 24NF	A/R
14	048-5371-044	PIN	6
15	211-3292	BRACKET, cylinder – left hand	2
	211-3293	BRACKET, cylinder – right hand	2
16	040-2071	COLLAR	2
17	REF.	CYLINDER, roll bar - (see section 5)	2
18	FS100926	CAPSCREW – 3/8" – 24NF x 1-3/4"	4
19	014-1537	PAD	2
20	080-1294	STOP	2
21	FS510900	WASHER, flat – 3/8"	4
22	FS240900	NUT, lock – 3/8" – 24NF	10

NOTE:
USED WITH 272-9917 LATCH KIT ONLY!

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ARM MECHANISM
272-3925



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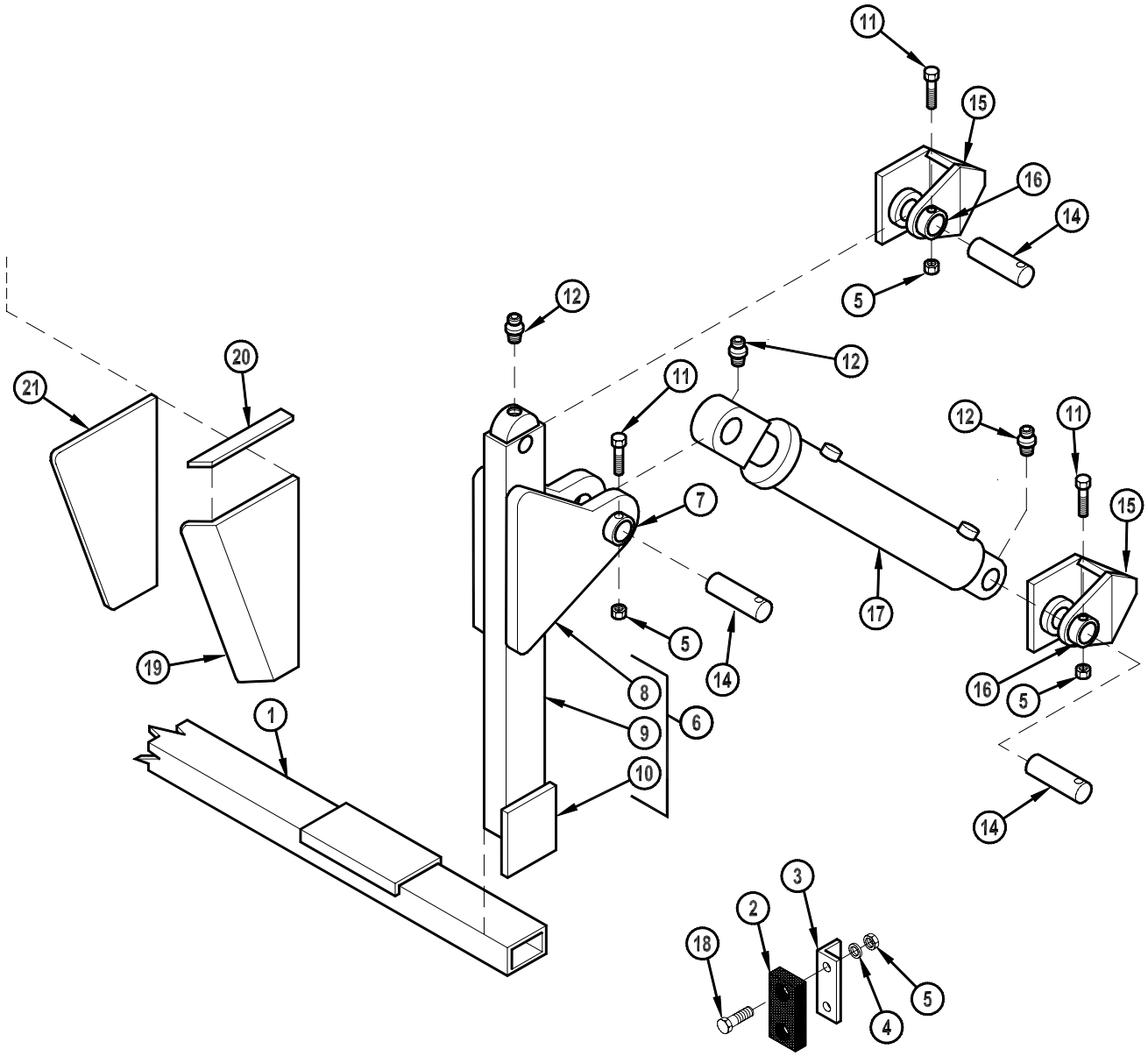
FORMULA 5000

ARM MECHANISM
272-3925

REF	PART NO.	DESCRIPTION	REQ'D
1	054-5038-SER	TUBE ASSEMBLY	1
2	040-2002	COLLAR – left hand	1
3	040-2003	COLLAR – right hand	1
4	040-1606	COLLAR	2
5	FS270900	NUT, lock – 3/8" – 24NF	2
6	048-2270-017	PIN, roll	4
7	093-1375-SER	ARM, side	2
8	FS301100	NUT, jam – 1/2" – 20NF	6
9	047-1210	BOLT (special)	4
10	047-1530	BOLT (special)	8
11	FS271100	NUT – 1/2" – 20NF	4
12	FS240700	NUT, lock – 3/8" – 24NF	10
13	FS090915	CAPSCREW – 3/8" – 24NF x 3/4"	2
14	NSS	WASHER, lock – 3/8"	2
15	048-3957	PIN ASSEMBLY	2
16	019-1041	SPRING, extension	2
17	115-0461	REFLECTOR	2
18	093-1786-SER	ARM ASSEMBLY, lift – right hand	1
	093-1785-SER	ARM ASSEMBLY, lift – left hand	1
19	048-2271-006	PIN, roll	1
20	040-1678	COLLAR	1
21	053-0897	LATCH	1
22	NSS	WASHER, flat	1
23	REF.	CYLINDER, arm (see section 5)	2
24	048-2852	PIN	2
25	230-0001-01	FITTING, grease	2
26	048-2850	PIN	2
27	FS090721	CAPSCREW – 1/4" – 28NF X 1"	8
28	FS510700	WASHER, flat – 1/4"	8
29	14-1536	PAD	4
30	080-1296	STOP, side arm – left hand – (not shown)	2
	080-1297	STOP, side arm – right hand (shown)	2
31	FS280700	NUT – 1/4" – 28NF	8
32	080-1293	STOP	2
33	230-0001-01	FITTING, grease	2
34	FS090932	CAPSCREW – 3/8" – 24NF	2
35	206-8235	BUMPER, rubber	2
36	FS071040	CAPSCREW – 7/16" – 14NC x 3"	8
37	FS551000	WASHER, lock – 7/16"	8
38	FS511000	WASHER, flat – 7/16"	8
39	FS281000	NUT, lock – 7/16" – 14NC	8
40	211-2419	BRACKET	2

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ROLL BAR MECHANISM
272-3923



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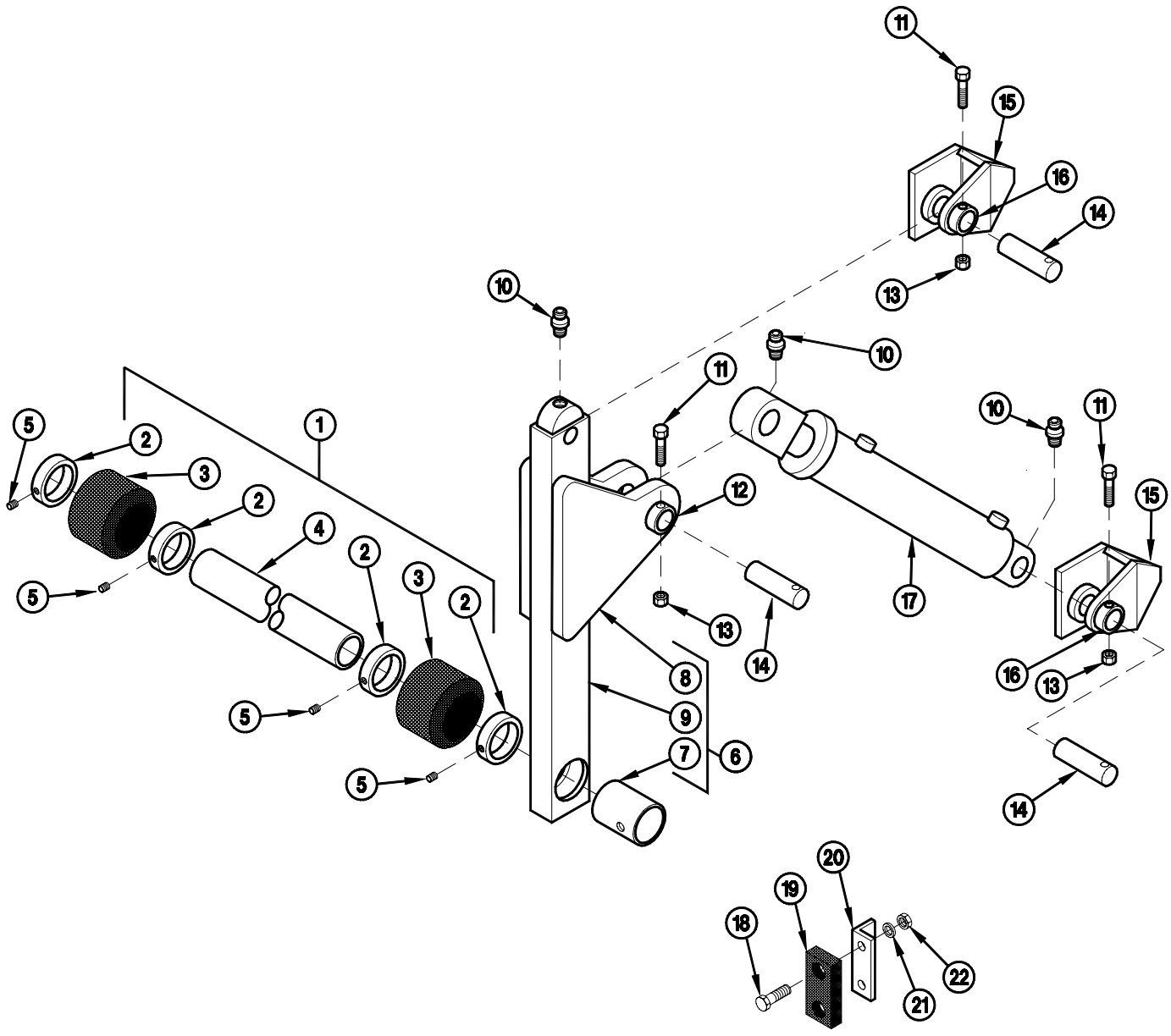
ROLL BAR MECHANISM
272-3923

REF	PART NO.	DESCRIPTION	REQ'D
1	207-5197	TUBE ASSEMBLY	1
2	14-1537	PAD	2
3	80-1294	STOP	2
4	FS510900	WASHER, flat – 3/8"	4
5	FS240900	NUT, lock – 3/8" – 24NF	A/R
6	93-1968	ARM, lift – left hand	1
	93-1967	ARM, lift – right hand	1
7	40-2071	COLLAR	1
8	207-5185	PLATE	2
9	93-1970	ARM – weldment	1
10	207-5188	PLATE	1
11	FS100934	CAPSCREW – 3/8" – 24NF x 2-3/4"	6
12	FS190400	FITTING, grease – 1/8" NPT x straight	A/R
13	121-1395	STEP ASSEMBLY	2
14	48-5371-44	PIN	6
15	211-3292	BRACKET, cylinder – left hand	2
	211-3293	BRACKET, cylinder – right hand	2
16	40-2071	COLLAR	1
17	REF.	CYLINDER, roll bar (see section 5)	2
18	FS100926	CAPSCREW – 3/8" – 24NF x 1-3/4"	4
19	64-3513	PLATE, guide, left hand	1
	64-3514	PLATE, guide, right hand	1
20	126-4869	CAP, support	2
21	126-4870	SUPPORT	2

SEE SECTION 4 FOR HYDRAULICS AND SECTION 5 FOR CYLINDER.

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ROLLER BAR MECHANISM with ROLLERS
272-6511



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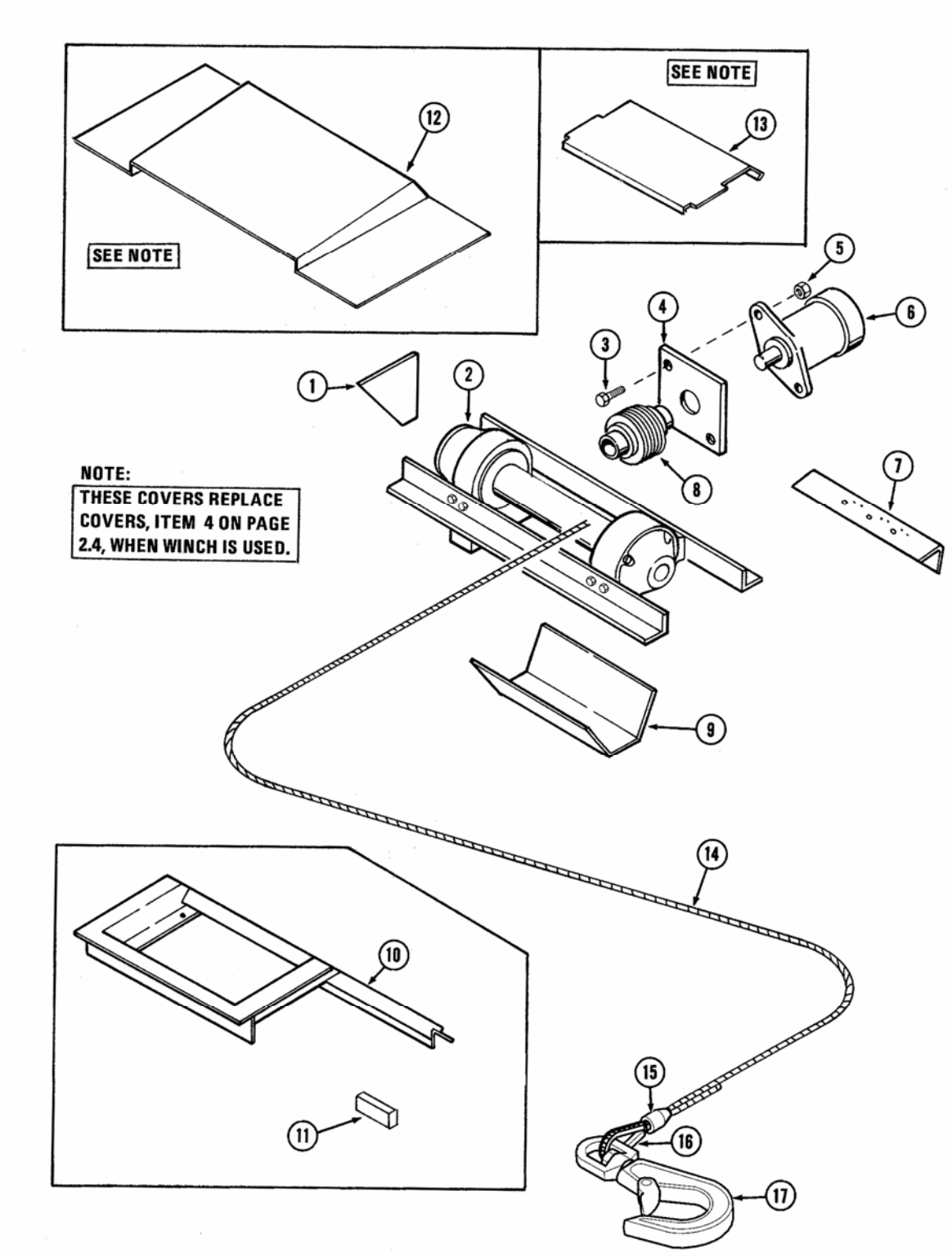
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ROLLER BAR MECHANISM with ROLLERS
272-6511

REF	PART NO.	DESCRIPTION	REQ'D
1	054-9525	CROSSTUBE ASSEMBLY	1
2	003-4527	BEARING	4
3	003-4426	BEARING	1
4	054-9526	SHAFT, cross	1
5	047-1088	SETSCREW	4
6	093-2817-SER	ARM, lift – left hand	1
	093-2818-SER	ARM, lift – right hand	1
7	003-4525	BEARING	1
8	207-5185	PLATE	2
9	093-2326	ARM WELDMENT	1
10	FS190400	FITTING, grease – 1/8" NPT x straight	6
11	FS100934	CAPSCREW – 3/8" – 24NF x 2-3/4"	6
12	040-2071	COLLAR, retaining	2
13	FS240900	NUT, lock – 3/8" – 24NF	A/R
14	048-5371-044	PIN	6
15	211-3292	BRACKET, cylinder – left hand	2
	211-3293	BRACKET, cylinder – right hand	2
16	040-2071	COLLAR	2
17	REF.	CYLINDER, roll bar - (see section 5)	2
18	FS100926	CAPSCREW – 3/8" – 24NF x 1-3/4"	4
19	014-1537	PAD	2
20	080-1294	STOP	2
21	FS510900	WASHER, flat – 3/8"	4
22	FS240900	NUT, lock – 3/8" – 24NF	10

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WINCH MECHANISM
253-1988



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WINCH MECHANISM
253-1988

REF	PART NO.	DESCRIPTION	REQ'D
-	253-1649-SER	WINCH & BRACKET ASSEMBLY	1
1	253-1647	WINCH ASSEMBLY	1
2	REF.	WINCH (see section 5)	1
3	FS071130	CAPSCREW – 1/2" – 13NC x 2"	2
4	211-0245	BRACKET	1
5	FS231100	NUT, lock – 1/2" – 13NC	2
6	REF.	MOTOR, winch (see section 5)	1
7	211-2744	BRACKET, rear light	1
8	45-0999	COUPLING (includes chain and couplings)	1
9	112-3994	COVER	1
10	207-3530	BRACKET, winch	1
11	211-0944	BRACE	2
12	207-3036	COVER	1
13	207-3540	COVER	2
-	97-0458	CABLE ASSEMBLY, winch	1
14	97-0377	ROPE, wire	1
15	97-0458-01	SLEEVE, swage	1
16	35-2072	THIMBLE	1
17	53-1964	HOOK	1

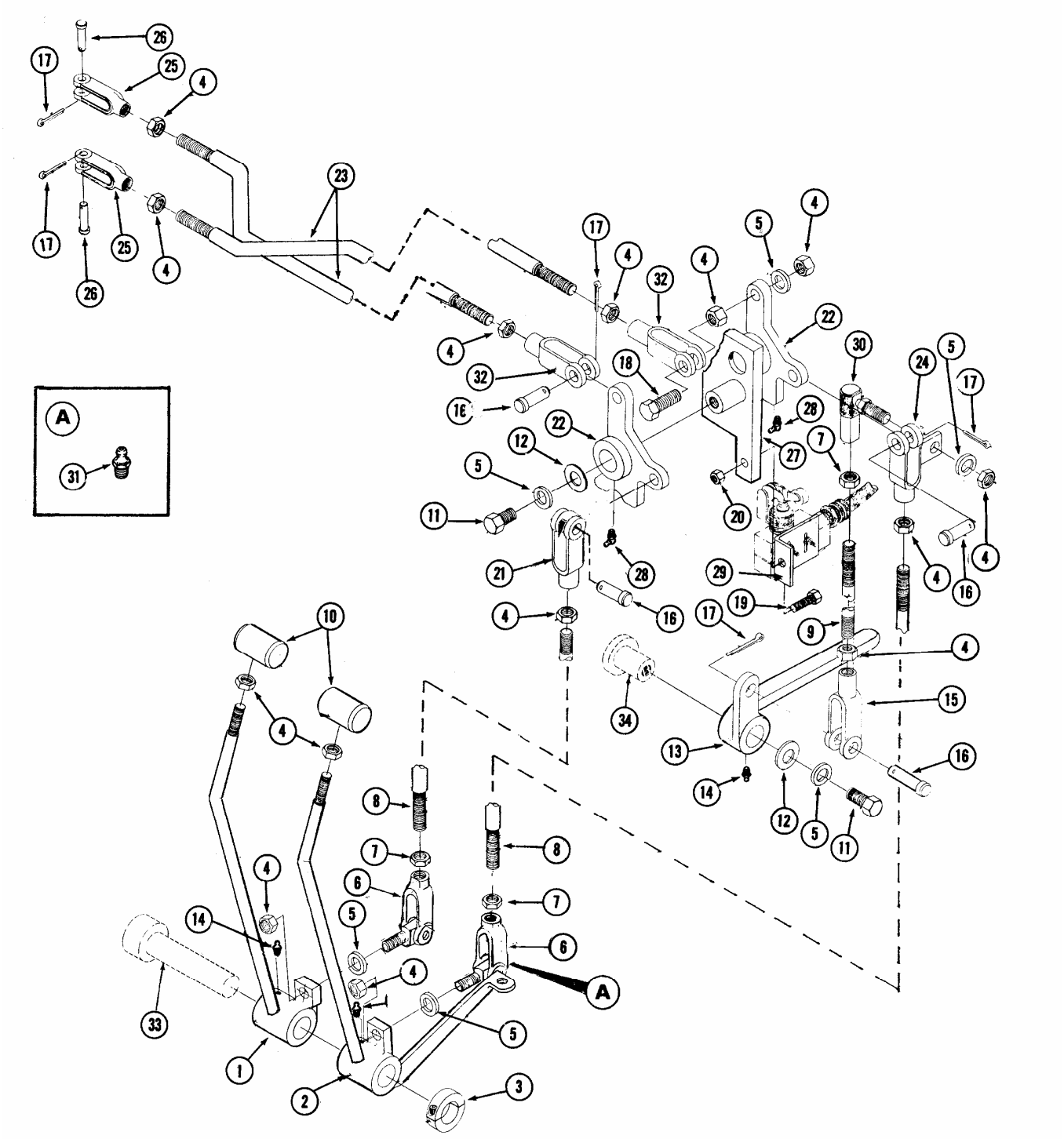
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TAILGATE CONTROLS and ATTACHING PARTS



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TAILGATE CONTROLS and ATTACHING PARTS

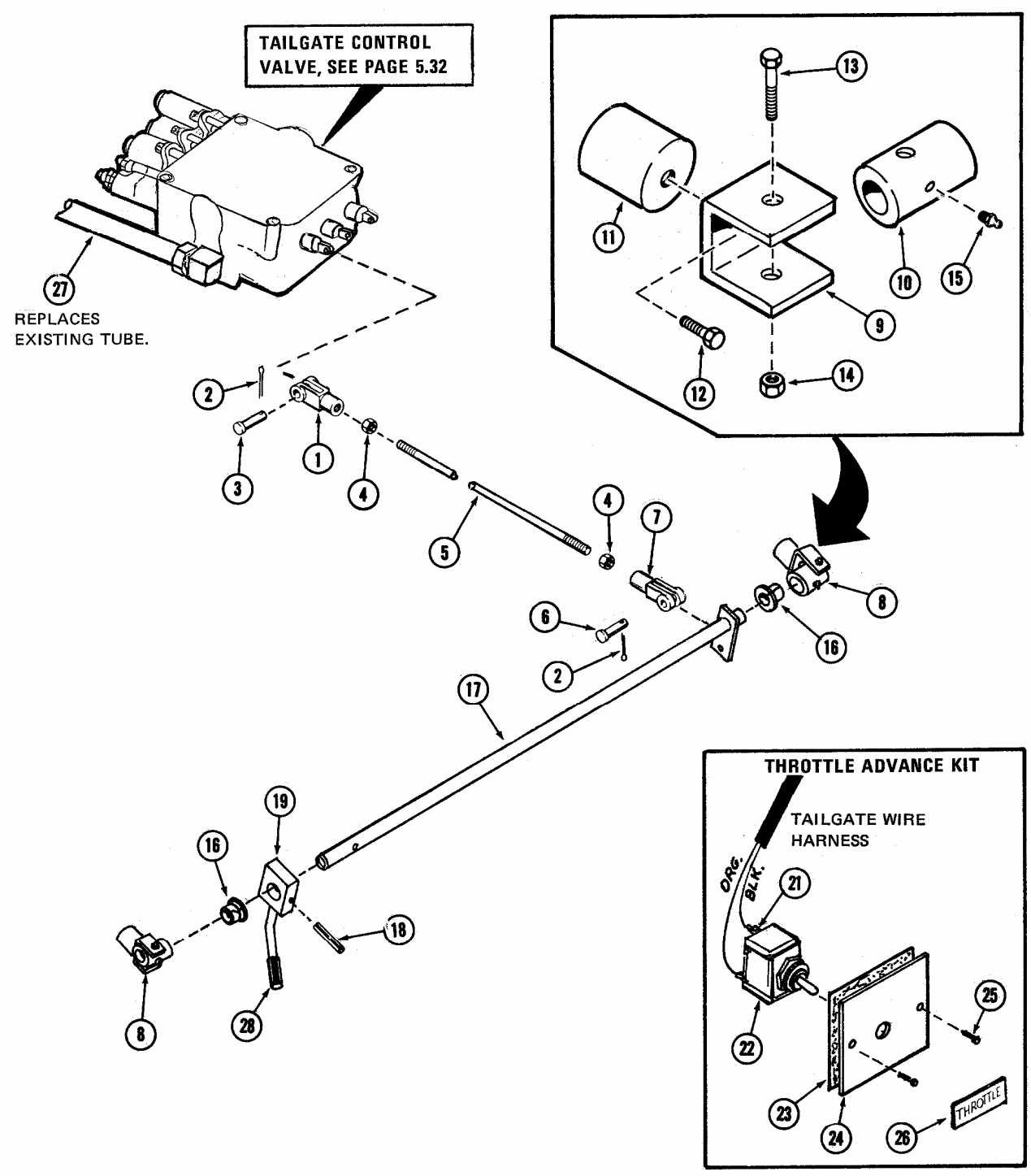
REF	PART NO.	DESCRIPTION	REQ'D
1	070-1401	HANDLE ASSEMBLY, control	1
2	070-1402	HANDLE ASSEMBLY, control	1
3	040-2070	COLLAR, lock	1
4	FS301100	NUT, jam – 1/2" – 20NF	A/R
5	FS591100	WASHER, lock – 1/2"	A/R
6	032-1011	JOINT, ball – (left hand thread)	2
7	FS211100	NUT, jam – (left hand thread)	3
8	027-4654	ROD	2
9	027-4655	ROD	1
10	70-1391	GRIP, handle	2
11	FS071120	CAPSCREW – 1/2" – 13NC x 1"	3
12	FS511100	WASHER, flat – 1/2"	3
13	013-5015	LEVER	1
14	FS190400	FITTING, grease – 1/8" NPT x straight	3
15	032-1492	YOKE	1
16	048-3127-006	PIN, clevis	4
17	FS340412	PIN, cotter – 1/8' x 3/4"	6
18	FS071134	CAPSCREW – 1/2" – 20NF x 2-1/2"	1
19	FS070820	CAPSCREW – 5/16" – 18NC x 1"	1
20	FS230800	NUT, lock – 5/16" – 18NC	1
21	032-1492	YOKE	1
22	013-5014	LEVER	2
23	027-4676	ROD	2
24	032-1003	YOKE	1
25	032-0991	YOKE	2
26	048-3997	PIN, clevis	2
27	211-3192	BRACKET ASSEMBLY	1
28	FS190490	FITTING, grease – 1/8" NPT x 90°	2
29	211-5522	BRACKET, limit switch	1
30	032-1005	JOINT, ball – (left hand thread)	1
31	FS190700	FITTING, grease – 1/4" NPT x straight	2
32	032-1009	YOKE – (left hand thread)	2
33	048-5434	PIN	1
34	048-5436	PIN	1

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SINGLE HYDRAULIC MECHANISM CONTROL
(WINCH, REEVING, ROLL BAR OR CONTAINER ARM)
272-3705



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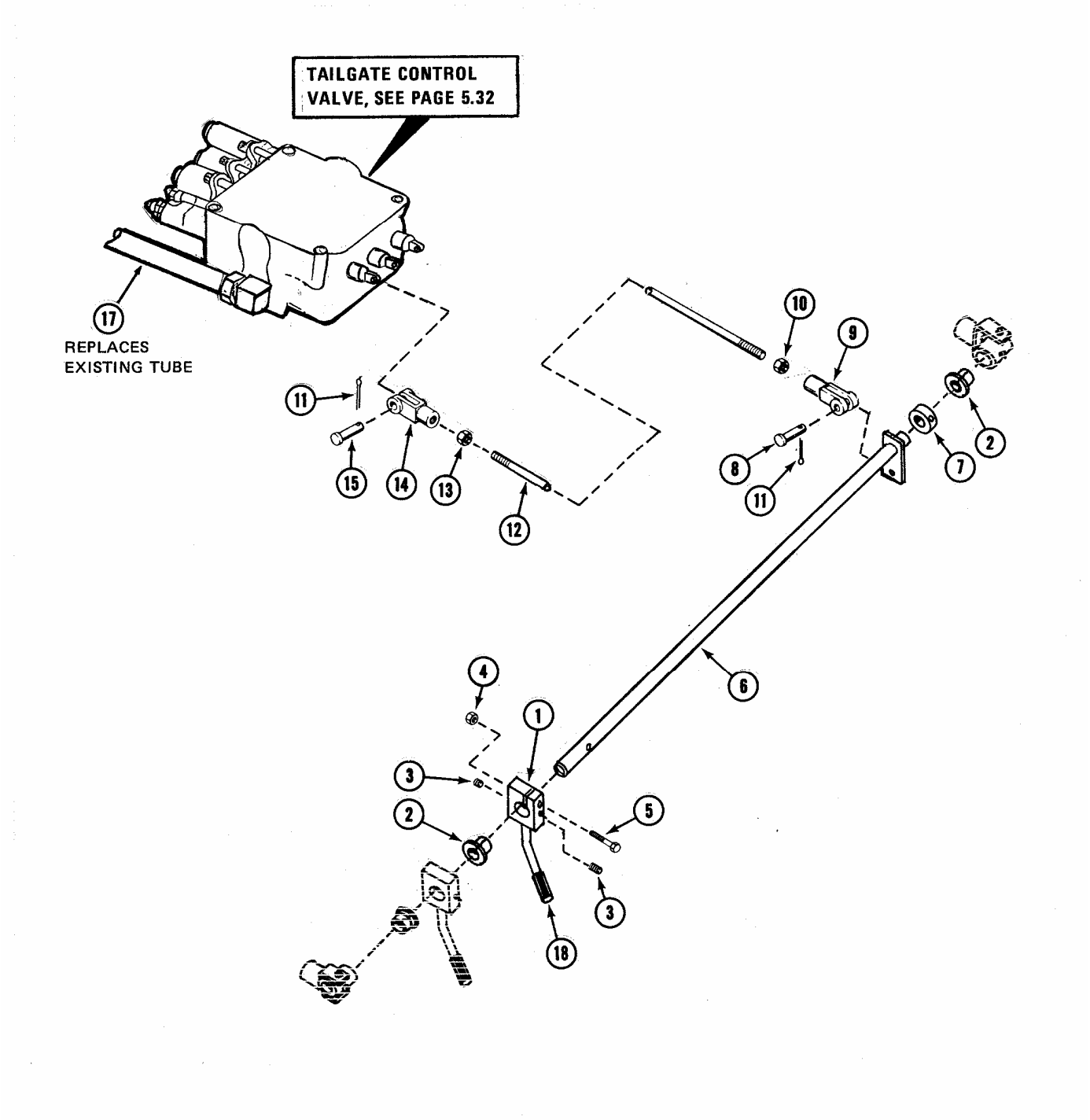
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SINGLE HYDRAULIC MECHANISM CONTROL (WINCH, REEVING, ROLL BAR OR CONTAINER ARM) 272-3705

REF	PART NO.	DESCRIPTION	REQ'D
1	032-0991	YOKE	1
2	FS340212	PIN, cotter	2
3	048-3997	PIN, clevis	1
4	FS301100	NUT, jam – 1/2" – 20NF	1
4A	FS201100	NUT, jam – 1/2" – 20NF (left hand threads)	1
5	027-4677	ROD, control	1
6	048-3127-004	PIN, clevis	1
7	032-1010	YOKE (left hand threads)	1
8	211-4095-99	BRACKET, pivot (includes items 9 thru 15)	2
9	211-2650	BRACKET	1
10	211-2651	BRACKET	1
11	211-4094	BRACKET	1
12	FS070920	CAPSCREW – 3/8" – 16NC x 1"	1
13	FS100934	CAPSCREW – 3/8" – 24NF x 2-1/2"	1
14	FS240900	NUT, lock – 3/8" – 24NF	1
15	FS190400	FITTING, grease – 1/8" NPT	1
16	003-3567	BEARING	2
17	027-3651-099	ROD, control	1
18	048-2271-012	PIN, roll	1
19	070-1441	HANDLE ASSEMBLY	1
20	108-3856	KIT, throttle switch (includes items 21 thru 26)	1
21	108-0025	RING, terminal	2
22	108-2279	SWITCH	1
	108-2280	BOOT	1
23	022-3108	GASKET	1
24	134-5674	PLATE, mounting	1
25	047-2151-001	SCREW, tek	2
26	212-1578-009	DECAL	1
27	054-7344-003	TUBE, hydraulic (pressure)	1
28	070-1172	GRIP, handle	1

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DOUBLE MECHANISM CONTROL for ROLL BAR, ARM OR REEVING CYLINDER 272-3873



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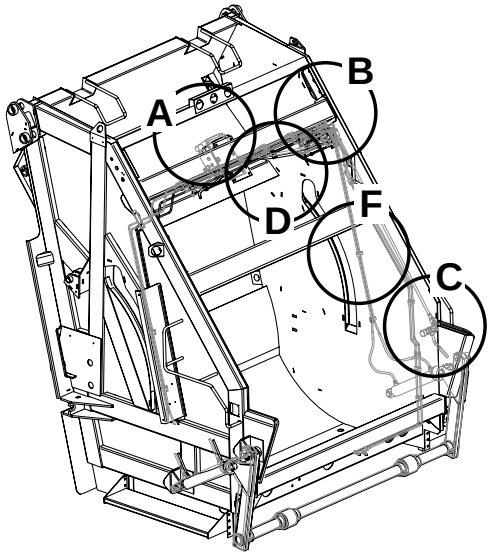
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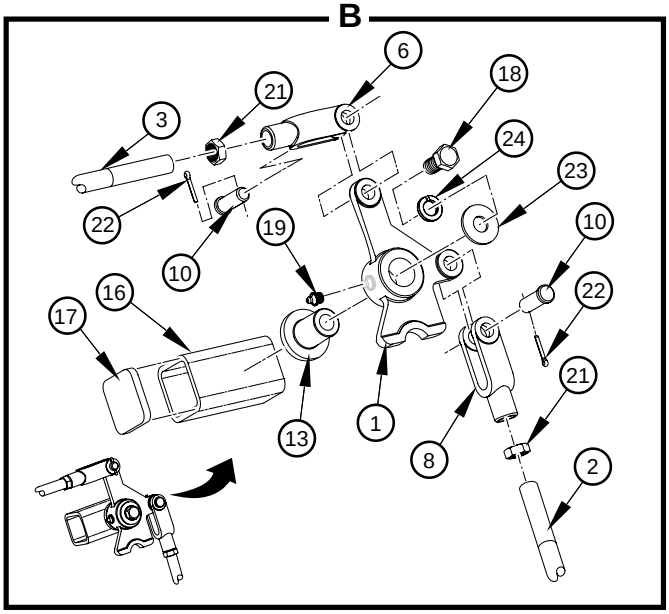
DOUBLE MECHANISM CONTROL for ROLL BAR, ARM OR REEVING CYLINDER 272-3873

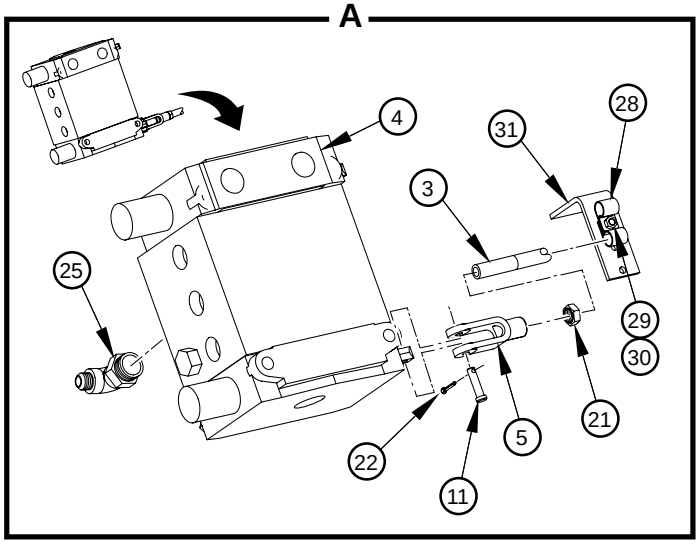
REF	PART NO.	DESCRIPTION	REQ'D
1	070-1446	HANDLE	1
2	003-3567	BEARING	2
3	047-1749	SETSCREW – 5/16" – 18NC x 1/2"	2
4	FS240900	NUT, lock – 3/8" – 24NF	1
5	FS100934	CAPSCREW – 3/8" – 24NF x 2-1/2"	1
6	027-4981	ROD, control	1
7	040-2058	COLLAR, lock	1
8	048-3127-004	PIN, clevis	1
9	032-1010	YOKE (left hand thread)	1
10	FS211100	NUT, jam – (left hand thread)	1
11	FS340212	PIN, cotter	2
12	027-4677	ROD	1
13	FS301100	NUT, jam – 1/2" – 20NF	1
14	032-0991	YOKE	1
15	048-3997	PIN, clevis	1
16	027-4679	KIT, tie rod (for 4-section valve)	1
17	054-7334-004	TUBE, hydraulic	1
18	070-1172	GRIP, handle	1

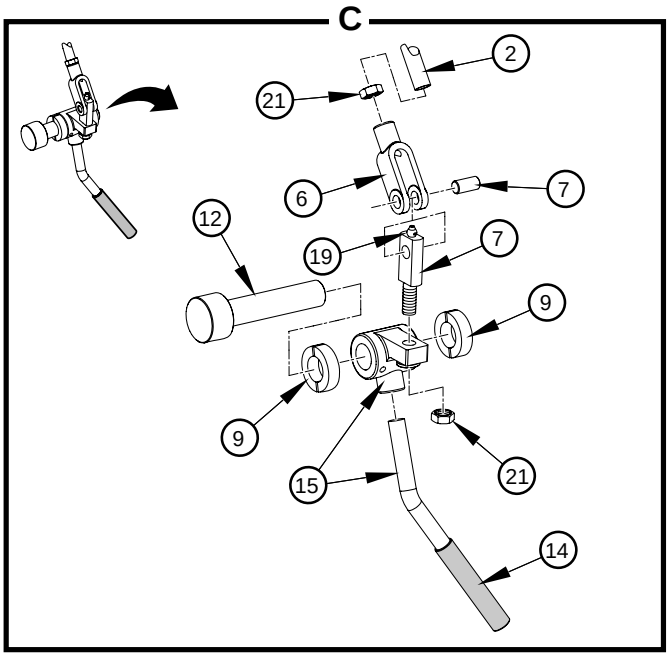
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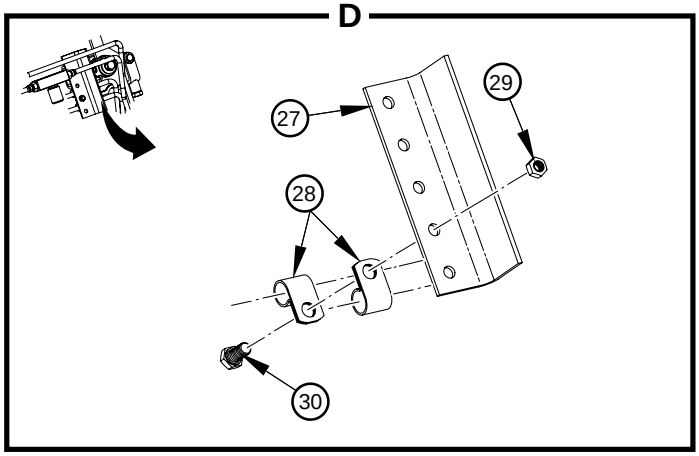
LEFT & RIGHT HAND SINGLE MECHANICAL CONTROL for CART DUMPER
372-1561 (RIGHT HAND)
372-1562 (LEFT HAND)

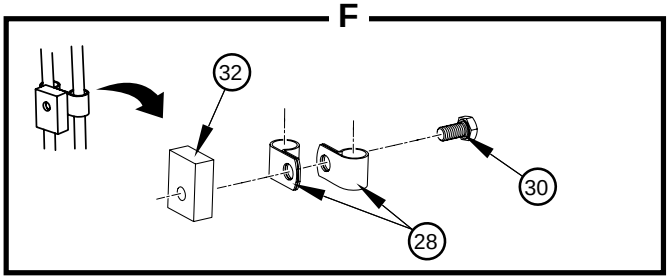










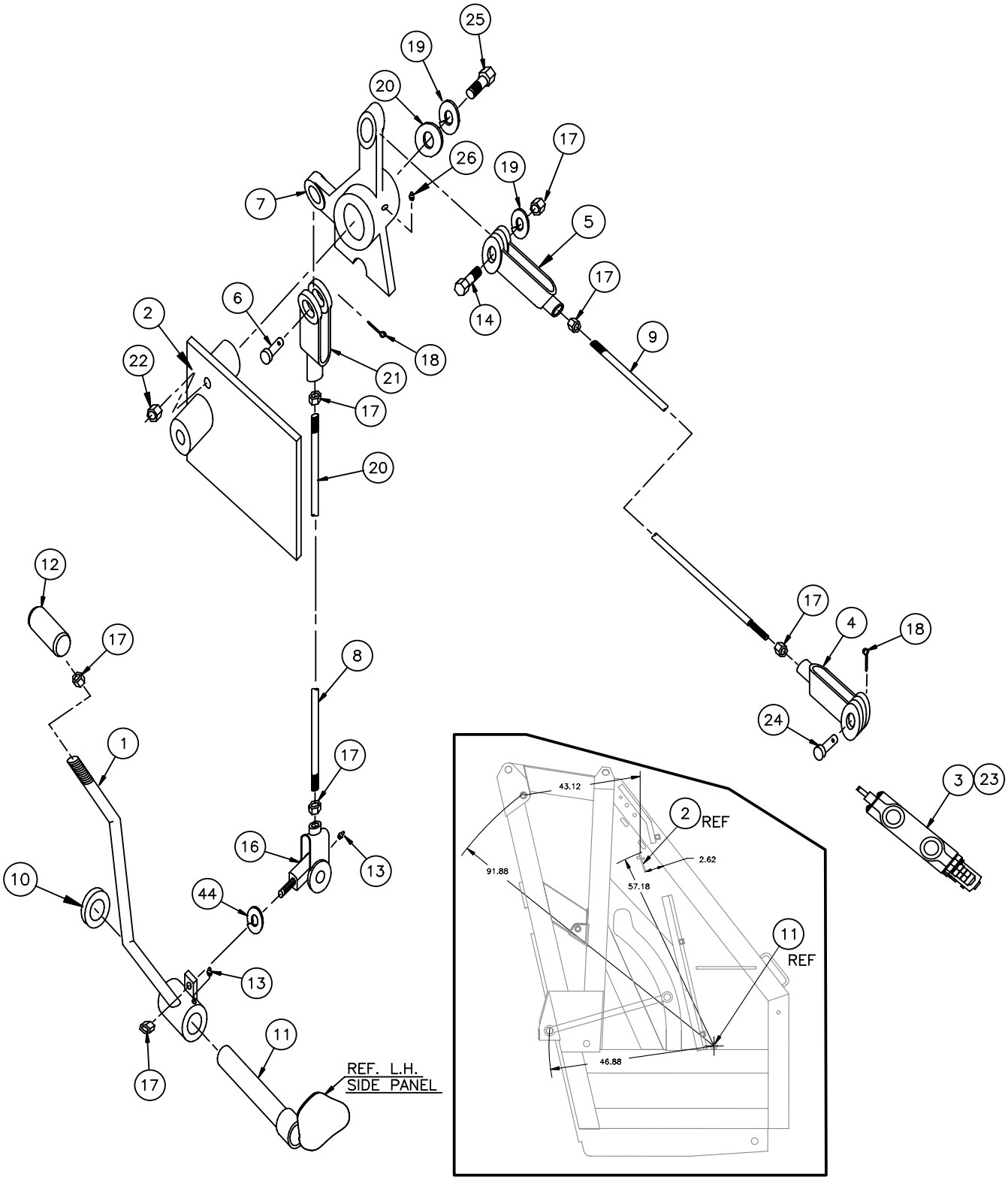


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LEFT & RIGHT HAND SINGLE MECHANICAL CONTROL for CART DUMPER
372-1561 (RIGHT HAND)
372-1562 (LEFT HAND)

REF	PART NO.	DESCRIPTION	REQ'D
1	013-5014	BELLCRANK	1
2	027-4654	ROD, tailgate control	1
3	027-4676	ROD, tailgate control	1
4	031-6278	VALVE SECTION, (left hand)	1
	031- 6267	VALVE SECTION, (right hand)	1
5	032-0991	YOKE, adjustable	1
6	032-1009	CLEVIS, rod end left hand	1
7	032-1011	YOKE ASSEMBLY	1
	048-5494	PIN, yoke assembly	1
8	032-1492	CLEVIS, rod end right hand	1
9	040-2070	COLLAR, lock	2
10	048-3127-006	CLEVIS, pin special	2
11	048-3997	CLEVIS, pin special	1
12	048-5434	PIN, tailgate control	1
13	048-5436	PIN, tailgate control	1
14	070-0680	GRIP, handle	1
15	070-1842	ASSEMBLY, control handle	1
	070-1831	ROD, control handle	1
16	311-0679	TUBE, support	1
17	311-0681	CAP, support tube	1
18	FS071120	CAPSCREW, 1/2" – 13 NC x 1.0"	1
19	FS190400	FITTING, grease 1/8" NPT stright	1
20	FS190700	FITTING, grease 1/4" – 28 stright	2
21	FS301100	NUT, jam 1/2" – 20 NF	5
22	FS340412	PIN, cotter, 1/8" x 3/4"	3
23	FS511100	WASHER, flat 1/2" standard	1
24	FS591100	WASHER, lock	1
25	054-3237-017	ELBOW, 90° reducing	2
27	177-5132	SUPPORT, bar	1
28	036-1122-006	CLAMP	A/R
29	FS230700	NUT, lock	2
30	FS100813	CAPSCREW	2
31	207-5203	BRACKET	3
32	077-6846	BLOCK,	1

LEFT HAND SINGLE MECHANICAL CONTROL
272-8734



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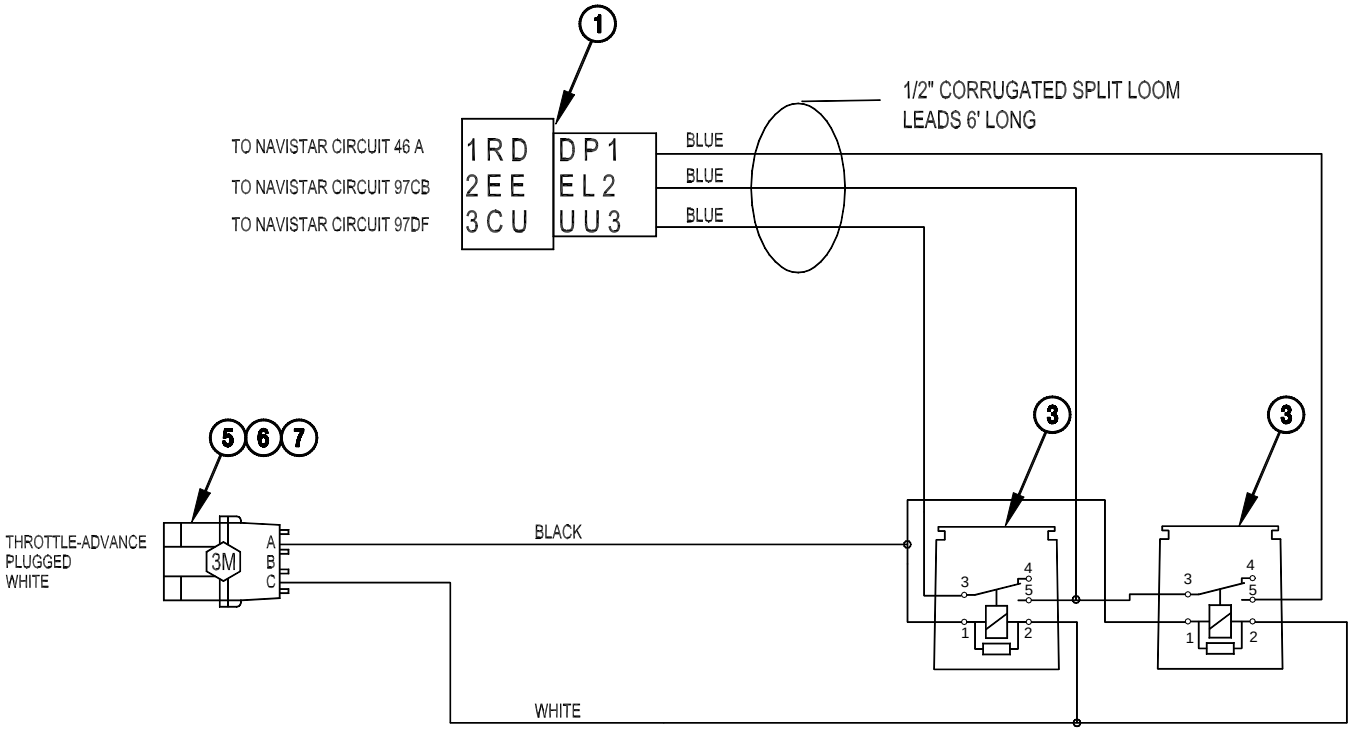
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LEFT HAND SINGLE MECHANICAL CONTROL
272-8734

REF	PART NO.	DESCRIPTION	REQ'D
1	070-1432	HANDLE, control left hand	1
2	211-6879	BRACKET, pivot weld left hand	1
3	031-6278	VALVE, section left hand	1
4	032-0991	YOKE	1
5	032-1009	YOKE, 1/2"	1
6	048-3127-006	CLEVIS, pin 1/2"	1
7	013-5014	LEVER	1
8	0274672	CONTROL ROD, left hand	1
9	027-4736	CONTROL ROD, right hand	1
10	040-2070	COLLAR, lock	1
11	048-5467	PIN, left hand	1
12	070-1391	HANDLE KNOBS	1
13	FS19-0790	FITTING, grease 90* 1/4" - 28	1
14	047-2186	CAPSCREW, 1/2" – 20 X 3	1
16	032-1011	ASSEMBLY, yoke	1
17	FS30-1100	JAM NUT 1/2" - 20	6
18	FS34-0412	COTTER PIN, 1/8" X 3/4"	2
19	FS591-100	WASHER, lock 1/2"	3
20	FS51-1100	WASHER, flat 1/2"	1
21	032-1492	CLEVIS, pin	1
22	FS24-1100	NUT, lock 1/2" - 13	1
23	027-4888	KIT, tie rod, 5 spool	1
24	048-3997	CLEVIS, pin	1
25	FS10-1134	CAPSCREW, 1/2" – 20 x 2 1/2"	1
26	FS19-0490	FITTING, grease 90*	1

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THROTTLE ADVANCE for ELECTRONIC CONTROLLED NAVISTAR ENGINE 272-1818-120



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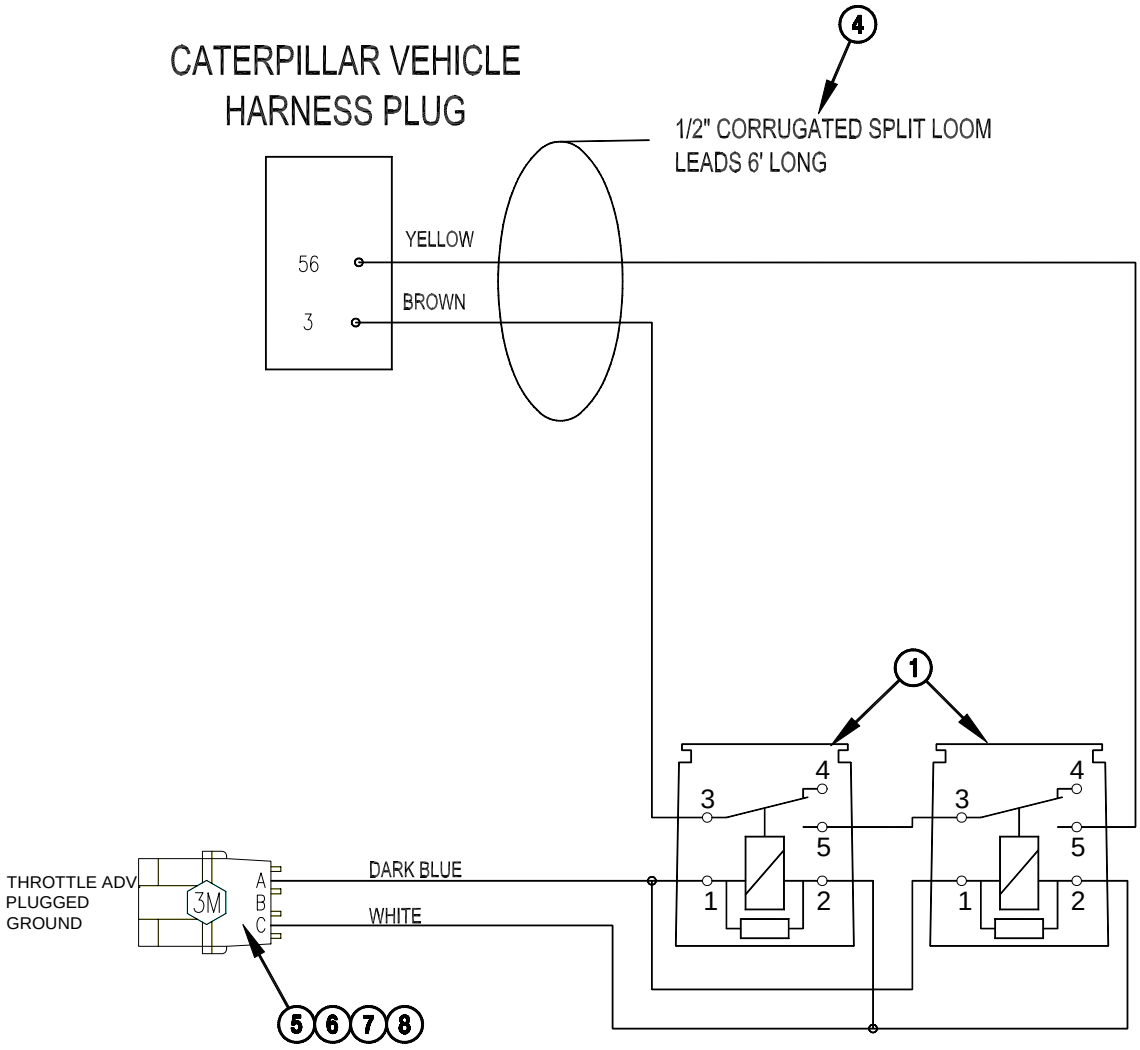
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THROTTLE ADVANCE for ELECTRONIC CONTROLLED NAVISTAR ENGINE 272-1818-120

REF	PART NO.	DESCRIPTION	REQ'D
1	108-6461-002	PLUG with hardware	1
2	036-1581	TIE, plastic	10
3	069-0032	KIT, micro relay (see section 5)	1
4	108-4476	LOOM, electrical	8ft
5	108-4827-005	CONNECTOR, 3-wkay male	1
6	108-4827-111	TERMINAL, male	2
7	108-4827-131	SEAL, cable	2
8	108-4827-133	PLUG, cavity (not shown)	1
9	108-5233-015	WIRE – 16 GA – (blue)	18ft
10	108-5233-017	WIRE – 16 GA – (black)	1ft
11	108-5233-022	WIRE – 16 GA - (white)	1ft

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THROTTLE ADVANCE for ELECTRONIC CONTROLLED CAT ENGINE 272-1818-121



WIRE COLOR	FUNCTION
DARK BLUE	THROTTLE ADVANCE
WHITE	GROUND
YELLOW	INPUT #1 PTO (ON/OFF)
BROWN	SENSOR COMMON

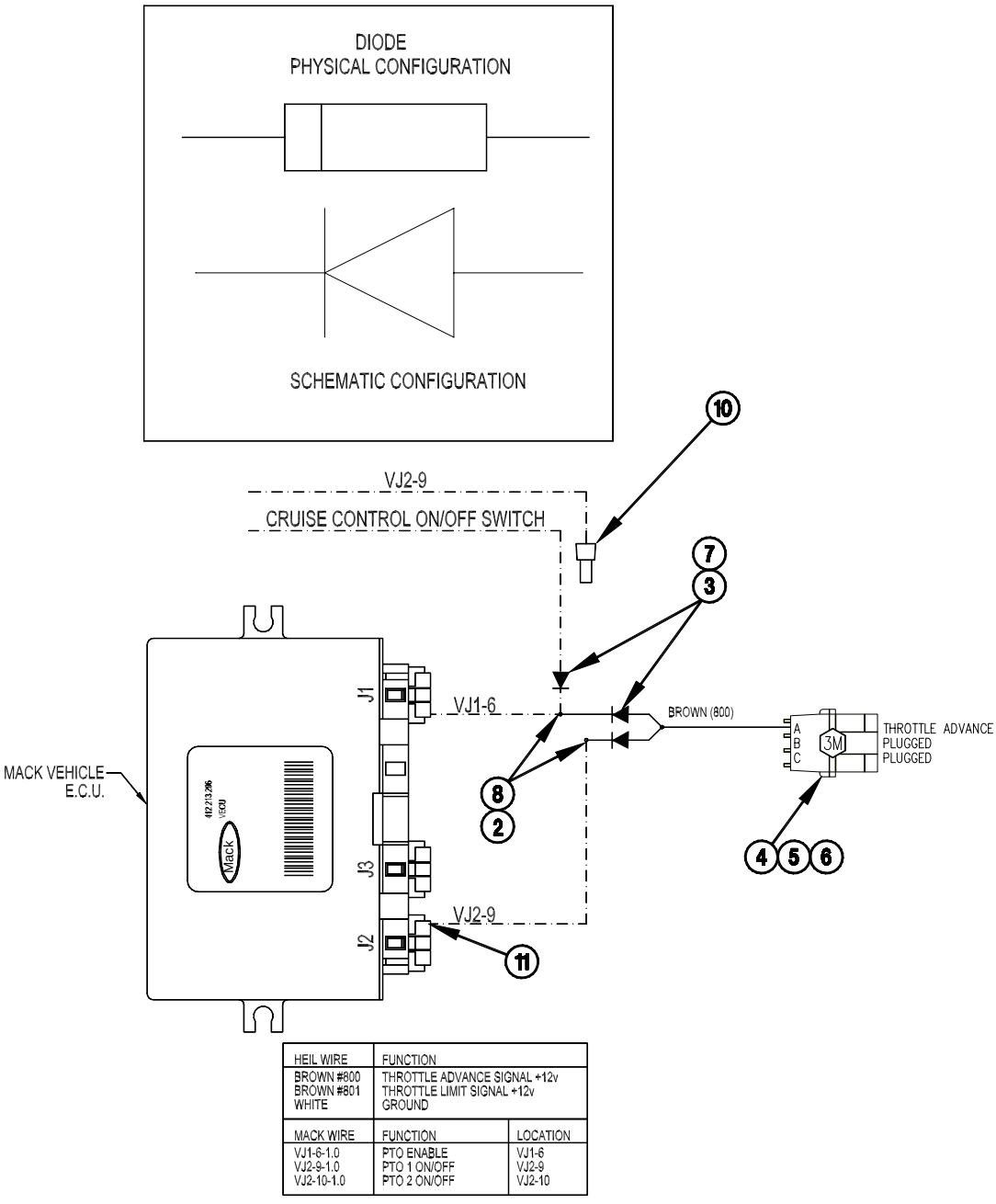
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THROTTLE ADVANCE for ELECTRONIC CONTROLLED CAT ENGINE 272-1818-121

REF	PART NO.	DESCRIPTION	REQ'D
1	069-0032	KIT, micro relay – (see section 6)	2
2	036-1581	TIE, plastic (not shown)	10
3	047-2151-001	TEK SCREW (not shown)	2
4	108-4476	LOOM, electrical	8ft
5	108-4827-005	CONNECTOR, 3-way male	1
6	108-4827-111	TERMINAL, male	2
7	108-4827-131	SEAL, cable	2
8	108-4827-133	PLUG, cavity	1
9	108-5233-015	WIRE – 16 GA (dark blue)	1ft
10	108-5233-021	WIRE – 16 GA (brown)	8ft
11	108-5233-022	WIRE – 16 GA (white)	2ft
12	108-5233-024	WIRE – 16 GA (yellow)	8ft

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THROTTLE ADVANCE for ELECTRONIC CONTROLLED Vmack ENGINES 272-1818-129



HEIL WIRE	FUNCTION	
BROWN #800 BROWN #801 WHITE	THROTTLE ADVANCE SIGNAL +12v THROTTLE LIMIT SIGNAL +12v GROUND	
MACK WIRE	FUNCTION	LOCATION
VJ1-6-1.0 VJ2-9-1.0 VJ2-10-1.0	PTO ENABLE PTO 1 ON/OFF PTO 2 ON/OFF	VJ1-6 VJ2-9 VJ2-10

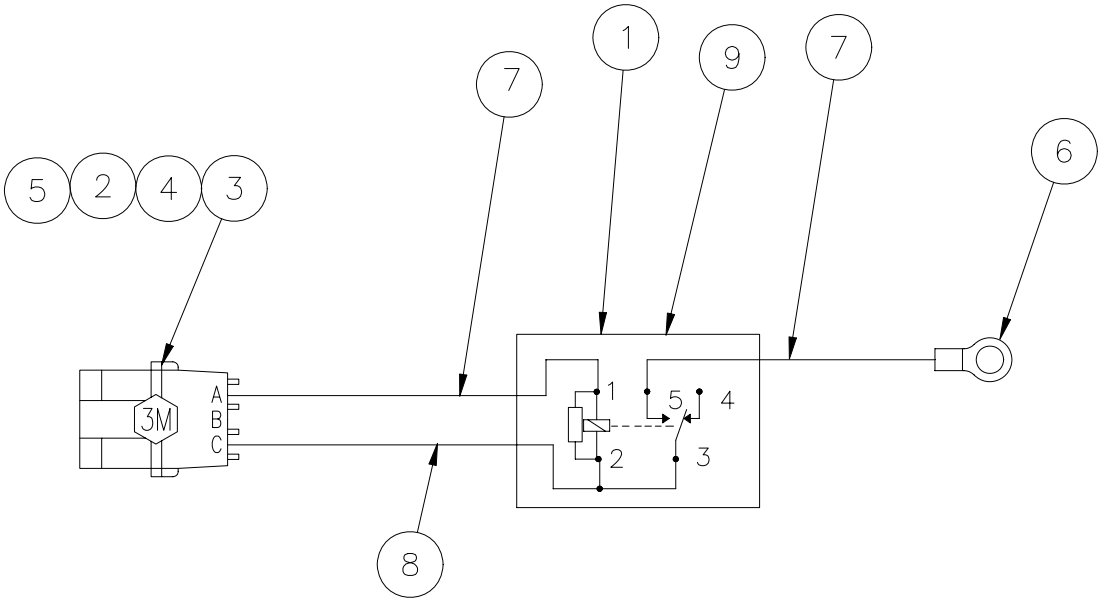
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THROTTLE ADVANCE for ELECTRONIC CONTROLLED Vmack ENGINES 272-1818-129

REF	PART NO.	DESCRIPTION	REQ'D
1	108-4827-133	PLUG, cavity	2
2	054-7350	TUBING, shrink	15"
3	108-2648	DIODE	3
4	108-4827-005	CONNECTOR, 3-way male	1
5	108-4827-111	TERMINAL, male	3
6	108-4827-131	SEAL, cable	1
7	108-5717-002	CONNECTOR, butt – 16-14	4
8	108-5717-003	CONNECTOR, butt – 12-10	6
9	108-6718-800	WIRE – 18 GA (brown "800")	3ft
10	108-3647	CONNECTOR, closed end	1
11	108-7114-03	PIN, Mack VECU	1

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THROTTLE ADVANCE KIT for ELECTRONIC CONTROLLED CRANE CARRIER ENGINE 272-1818-141



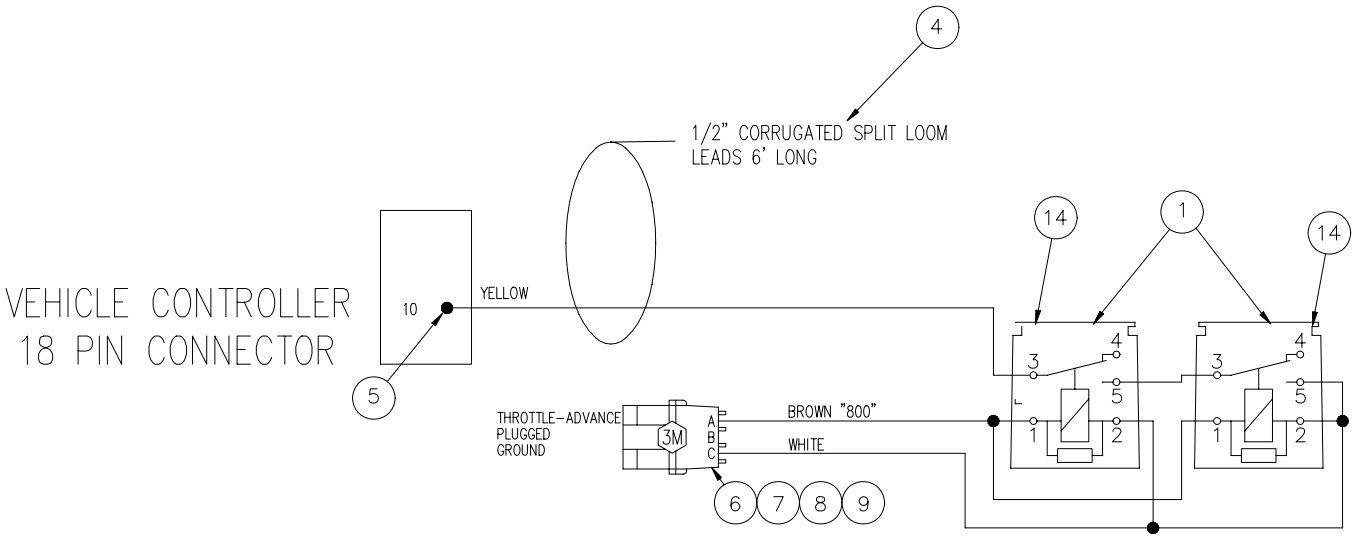
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THROTTLE ADVANCE KIT for ELECTRONIC CONTROLLED CRANE CARRIER ENGINE 272-1818-141

REF	PART NO.	DESCRIPTION	REQ'D
1	069-0032	RELAY (see section 6)	1
2	108-4827-132	SEAL, cable	2
3	108-4827-005	CONNECTOR, 3-way male	1
4	108-4827-111	TERMINAL, male	2
5	108-4827-133	PLUG, cavity	1
6	108-4943-003	TERMINAL, ring - #6	1
7	108-6716-800	WIRE – 16 GA – brown "800"	18 inches
8	108-6716-GND	WIRE – 16 GA – "GND"	1 ft.
9	212-2777-013	DECAL	1

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THROTTLE ADVANCE KIT for ELECTRONIC CONTROLLED MERCEDES BENZ ENGINE 272-1818-144



WIRE COLOR	FUNCTION
BROWN "800"	THROTTLE ADVANCE
WHITE	GROUND
YELLOW	MERCEDES BENZ REMOTE PTO (ON/OFF)

PROGRAMING PARAMETERS FOR THROTTLE ADVANCE
TOOL: DDDL INTERFACE
SOFTWARE: DETROIT DIESEL DIAGNOSTIC LINK 6.21 OR HIGHER

TO START: DOUBLE CLICK DETROIT (DIAGNOSTIC LINK)
CLICK ON RETRIEVE CALIBRATION FROM ECU ICON. (WRENCH)
OPEN VCU GROUP 7-PTO CONTROL ON PTO & CC
1. CONFIGURE PTO SPEED CONTROLS (ENABLE)
2. PTO DROPOUT W/ SERVICE BRAKE OR PARK BRAKE
(NO PTO DROPOUT W/ SERVICE BRK OR P BRK ENABLED)
3. PTO DROPOUT ON CLUTCH ENABLED
(NO PTO DROUT WITH CLUTCH PEDAL)
4. MAX ROAD SPEED IN PTO MODE (6 MPH)
5. PTO RATE RATE (500)
6. PTO SPEED #1 (SET THROTTLE ADVANCE)
CLICK ON TRANSMIT (RH BOTTOM)
CLICK ON CLOSE (RH BOTTOM)
SELECT NO

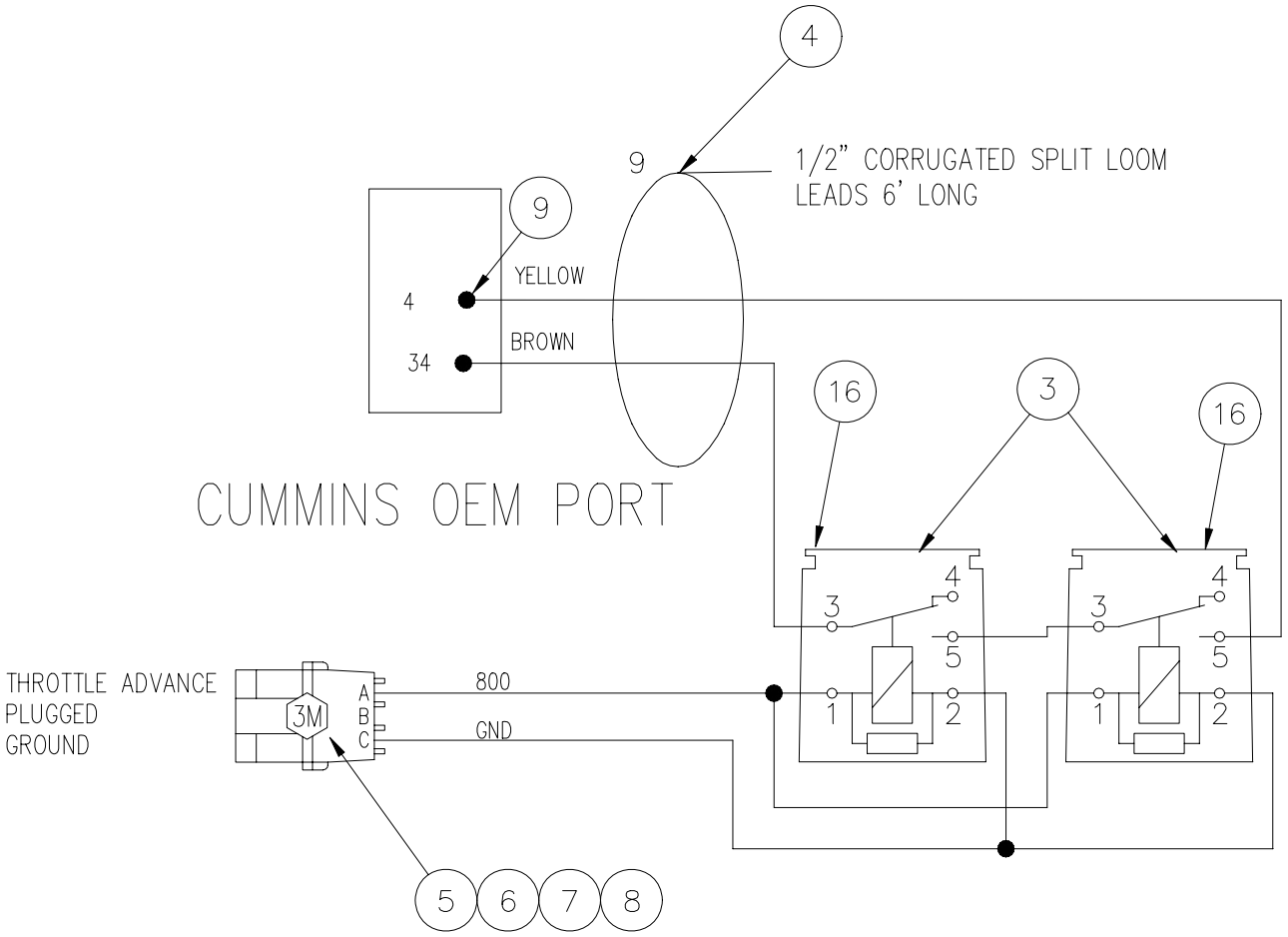
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THROTTLE ADVANCE KIT for ELECTRONIC CONTROLLED MERCEDES BENZ ENGINE 272-1818-144

REF	PART NO.	DESCRIPTION	REQ'D
1	069-0032	KIT, micro relay – (see section 6)	2
2	036-1581	TIE, plastic (not shown)	10
3	047-2151-001	TEK SCREW (not shown)	2
4	108-4476	LOOM, electrical	8ft
5	108-7114-005	PIN, Mercedes Benz	1
6	108-4827-005	CONNECTOR, 3-way male	1
7	108-4827-111	TERMINAL, male	2
8	108-4827-131	SEAL, cable	2
9	108-4827-133	PLUG, cavity	1
10	108-5233-024	WIRE – 16 GA (yellow)	8ft
11	108-6761-800	WIRE – 16 GA (brown "800")	1ft
12	108-6761-GND	WIRE – 16 GA (white "GND")	2ft
14	212-2773-013	DECAL	2

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THROTTLE ADVANCE KIT for ELECTRONIC CONTROLLED CUMMINS (GAS RECIRCULATION) ENGINE 272-1818-203



PROGRAMING PARAMETERS FOR THROTTLE ADVANCE
FROM THE COMPUTER DESKTOP OPEN CUMMINS INSITE (NOT INSITE PRO) LOWER RH CORNER OF SCREEN SELECT INSITE TOOL TYPE SELECT ADJUSTMENTS SELECT FEATURES AND PARAMETERS SELECT REMOTE PTO SELECT NUMBER OF SPEEDS AND SET TO 1 NOTE: DOUBLE CLICK ON PARAMETERS TO CHANGE AFTER CHANGE IS COMPLETE DEPRESS THE ENTER KEY SELECT SET SPEED 1 AND SET TO THROTTLE ADVANCE SPEED DESIRED SELECT RAMP RAMP AND SET TO 500 RPM/S LEAVE MAX SPEED AT 6MPH (CHANGE IF NECESSARY) RIGHT CLICK ON ICON AT TOP OF SCREEN WHICH LOOKS LIKE A COMPUTER SCREEN SELECT YES FROM POP UP BOX WHEN INSTRUCTED TURN OFF KEY SWITCH FOR 30 SECONDS IF PARAMETERS WERE SUCCESSFULLY CHANGED YOU WILL GET THE FOLLOWING MESSAGE "ALL PARAMETERS SUCCESSFULLY WRITTEN. SELECT OKAY

WIRE	FUNCTION
800	THROTTLE ADVANCE
GND	GROUND
YELLOW	REMOTE PRO
BROWN	SENSOR COMMON

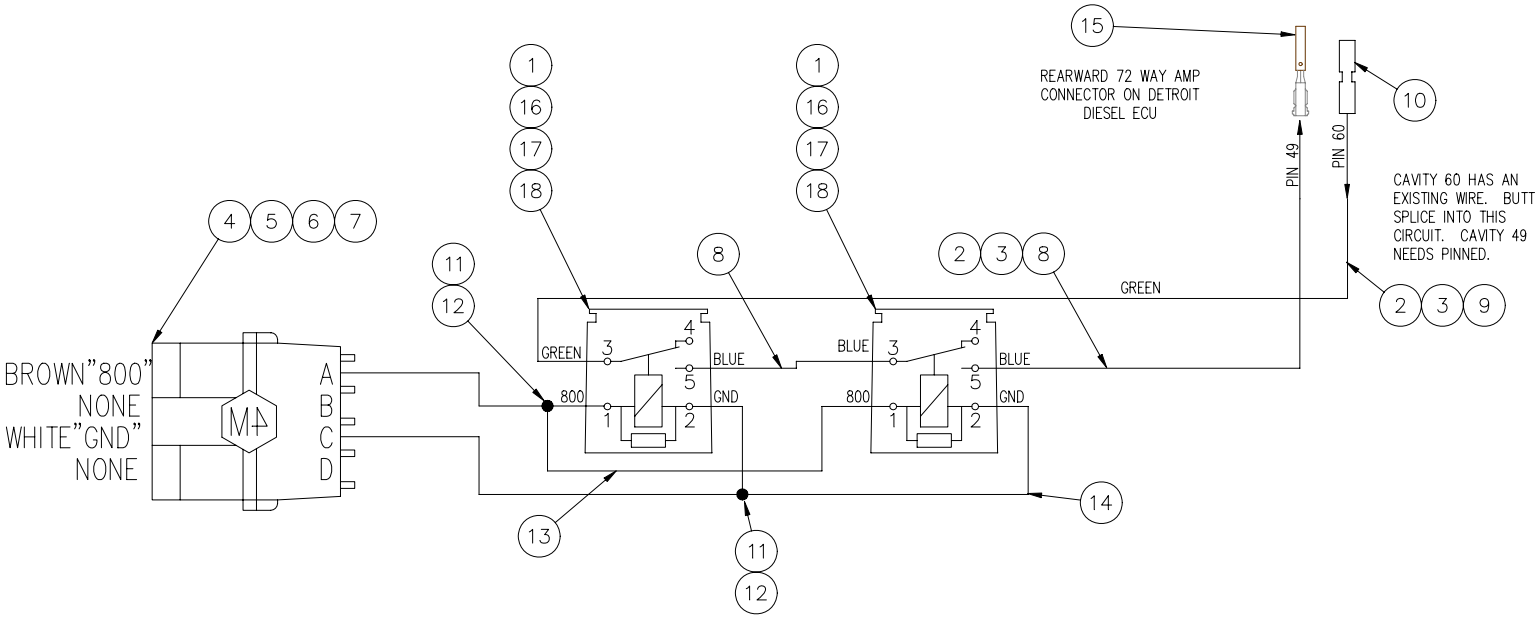
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THROTTLE ADVANCE KIT for ELECTRONIC CONTROLLED CUMMINS (GAS RECIRCULATION) ENGINE 272-1818-203

REF	PART NO.	DESCRIPTION	REQ'D
1	036-1581	TIE, plastic (not shown)	10
2	047-2151-001	TEK SCREW (not shown)	2
3	069-0032	KIT, micro relay – (see section 6)	2
4	108-4476	LOOM, electrical	8ft
5	108-4827-005	CONNECTOR, 3-way male	1
6	108-4827-111	TERMINAL, male	2
7	108-4827-131	SEAL, cable	2
8	108-4827-133	PLUG, cavity	1
9	108-4815-113	SOCKET	1
10	108-5233-021	WIRE – 16 GA – brown	1 ft.
11	108-5233-024	WIRE – 16 GA (yellow)	8 ft.
12	108-5717-003	SPLICE, butt	1
13	108-7583-038	SHRINK, tube	3 inches
14	108-6761-800	WIRE – 16 GA (brown "800")	8 ft
12	108-6761-GND	WIRE – 16 GA (white "GND")	2 ft
14	212-2773-013	DECAL	2

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THROTTLE ADVANCE KIT for ELECTRONIC CONTROLLED DDEC V ENGINE 272-1818-208



PROGRAMING PARAMETERS FOR THROTTLE ADVANCE
USING THE DDDL SOFTWARE PERFORM THE FOLLOWING PROGRAMMING: 1: CONNECT TO VEHICLE 2: OPEN DDDL PROGRAM 3: INSIDE ISD/VSG TAB, SET THE VARIABLE SPEED TO 1200–1400 (RANGE 600–1600) 4: INSIDE CRUISE TAB, SET INITIAL RPM TO SAME VALUE AS PREVIOUS STEP 1200–1400 5. TRANSMIT FOR ANY QUESTIONS CALL DDEC HOTLINE: 313–592–7050 OR 313–592–5800 * NOTE: IF CUSTOMER HAS NOT ORDERED THROTTLE ADV/PTO FEATURES FROM FACTORY, THE ECU WILL HAVE TO BE "REBURNED" AT A LOCAL DETROIT DEALER. WILL NOT WORK WITHOUT IT. THERE IS A DEALER CHARGE FOR THIS.

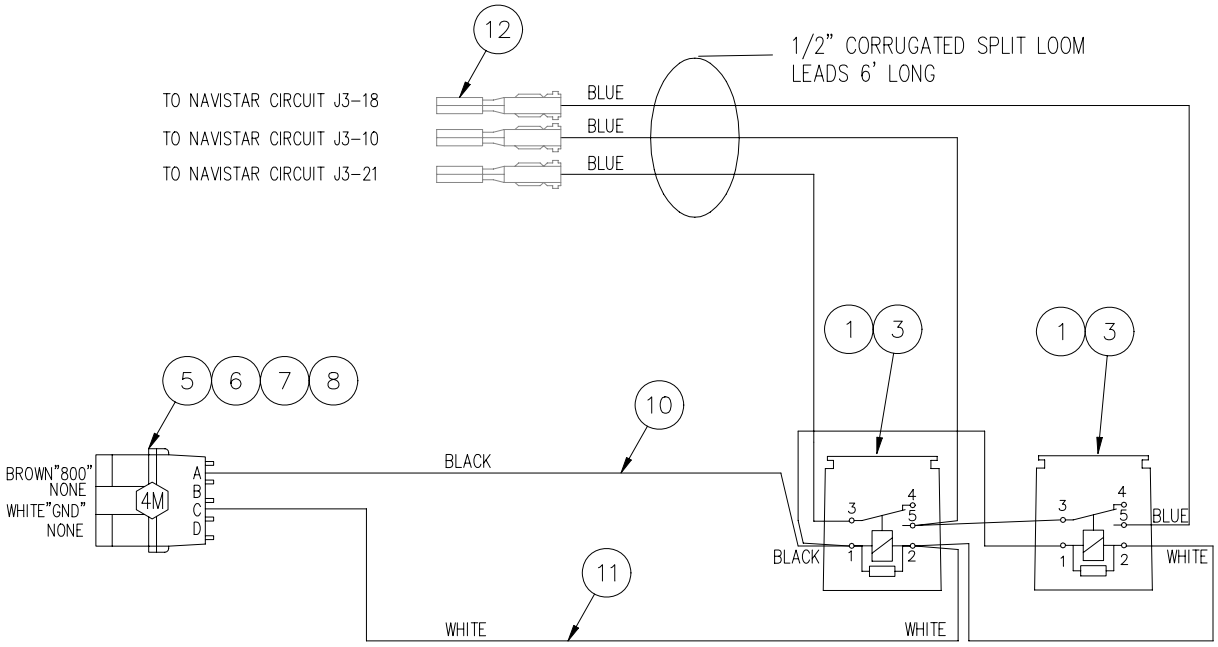
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THROTTLE ADVANCE KIT for ELECTRONIC CONTROLLED DDEC V ENGINE 272-1818-208

REF	PART NO.	DESCRIPTION	REQ'D
1	069-0032	KIT, micro relay – (see section 6)	2
2	036-1581	TIE, plastic (not shown)	10
3	108-4476	LOOM, electrical	8ft
4	108-4827-007	CONNECTOR, 4-way male	1
5	108-4827-111	TERMINAL, male	4
6	108-4827-131	SEAL, cable	2
7	108-4827-133	PLUG, cavity	2
8	108-5233-015	WIRE – 16 GA – blue	10 ft
9	108-5233-025	WIRE – 16 GA – green	10 ft
10	108-5717-002	CONNECTOR, butt	1
11	108-5717-003	SPLICE, butt	1
12	108-6363	SHRINK, tube	6 inches
13	108-6761-800	WIRE – 16 GA (brown "800")	4 ft
14	108-6761-GND	WIRE – 16 GA (white "GND")	4 ft
15	108-8264	PIN, female	2
16	212-2773-013	DECAL	2

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THROTTLE ADVANCE KIT for ELECTRONIC CONTROLLED NAVISTAR W/REMOTE SPEED CONTROL ENGINE 272-1818-209



PROGRAMMING PARAMETERS NAVISTARS THROTTLE ADVANCE		
PTO MODE	=	REMOTE ONLY
IN CAB MODE	=	MOBILE VARIABLE
DISABLE CAB CONTROLS	=	YES
SET SPEED	=	(****) THROTTLE ADV. RPM
RESUME SPEED	=	(****) THROTTLE ADV. SPEED
MAXIMUM PTO RPM	=	(****) THROTTLE ADV. SPEED
P.T.O. SPEED RAMP RATE	=	500 RPM/SECOND
MAX ROAD SPEED FOR PTO	=	5 MPH

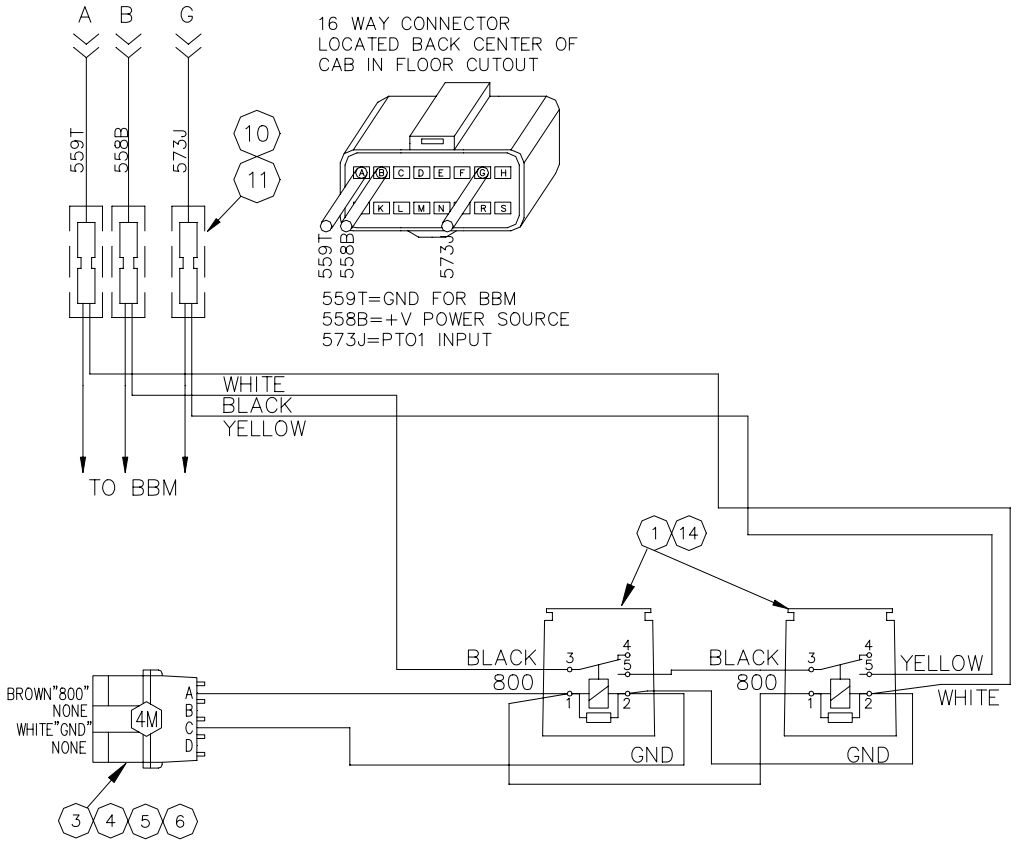
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THROTTLE ADVANCE KIT for ELECTRONIC CONTROLLED NAVISTAR W/REMOTE SPEED CONTROL ENGINE 272-1818-209

REF	PART NO.	DESCRIPTION	REQ'D
1	212-2773-013	DECAL, throttle	2
2	036-1581	TIE, plastic (not shown)	10
3	069-0032	KIT, micro relay – (see section 6)	2
4	108-4476	LOOM, electrical	8ft
5	108-4827-007	CONNECTOR, 4-way male	1
6	108-4827-111	TERMINAL, male	3
7	108-4827-131	SEAL, cable	3
8	108-4827-133	PLUG, cavity	3
9	108-5233-015	WIRE – 16 GA – blue	18 ft
10	108-5233-017	WIRE – 16 GA – black	1 ft
11	108-5233-022	WIRE – 16 GA – white	1 ft
12	108-8269	PIN, Navistar	4

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THROTTLE ADVANCE KIT for ELECTRONIC CONTROLLED VOLVO VN & VHD w/BB MODULE ENGINE 272-1818-218



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THROTTLE ADVANCE KIT for ELECTRONIC CONTROLLED VOLVO VN & VHD w/BB MODULE ENGINE 272-1818-218

REF	PART NO.	DESCRIPTION	REQ'D
1	069-0032	KIT, micro relay – (see section 6)	2
2	108-4476	LOOM, electrical	3ft
3	108-4827-007	CONNECTOR, 4-way male	1
4	108-4827-111	TERMINAL, male	3
5	108-4827-131	SEAL, cable	3
6	108-4827-133	PLUG, cavity	2
7	108-5233-017	WIRE – 16 GA – black	18 inches
8	108-5233-022	WIRE – 16 GA – white	12 inches
9	108-5233-024	WIRE – 16 GA – yellow	12 inches
10	108-5717-003	SPLICE, butt	1
11	108-6363	SHRINK, tube	6 inches
12	108-6761-800	WIRE – 16 GA (brown "800")	30 inches
13	108-6761-GND	WIRE – 16 GA (white "GND")	4 ft
14	212-2773-013	DECAL	2

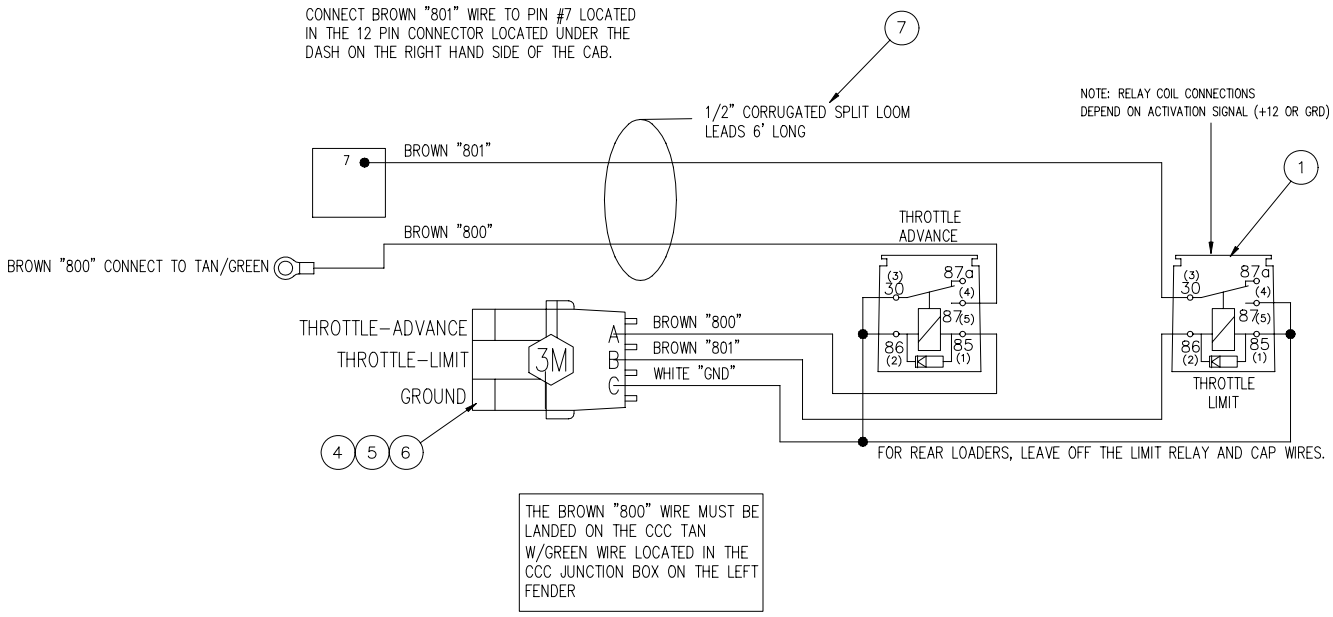
PROGRAMMING PARAMETERS:

- Turn on Computer
- Plug in Interface to Vehicle/Turn key
- After Computer boots up, plug interface in to computer
- Double Click on "VOLVO" Icon
- CHANGE THE FOLLOWING VECU PARAMETERS:
 - AZG=0
 - XM=0
 - DA=LOWEST POSSIBLE VALUE
 - XP=0
 - AND=1200(FMPUMP) OR 1400(PTO)
 - ANF=500
 - ANE=1200(FMPUMP) OR 1400(PTO)
 - RT=50
 - QP=1
 - AZH=1
 - XO=0
- CHANGE THE FOLLOWING BBM PARAMETERS:
 - IC=1
 - YJ=1
 - HH=0
 - BRR=0
 - BRV=0
 - HZ=250 (RAMP RATE)
 - HE=0
 - HT=0
 - AA=1200(FMPUMP) OR 1400(PTO)
 - DC=500
 - HB=1200(FMPUMP) OR 1400(PTO)
 - IF=50
 - ID=0
 - IE=0
 - YO=0
- SEND CHANGES
- COMPLETE!

*NOTE: 0=NO 1=YES

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THROTTLE ADVANCE KIT for ELECTRONIC CONTROLLED CRANE CARRIER w/J. DEERE ENGINE 272-8539-009



PROGRAMING PARAMETERS FOR THROTTLE LIMIT AND ADVANCE

IDLE, ELEVATED AND THROTTLE LIMIT
ELEVATED IDLE SETUP
THROTTLE ADV (rpm) 1200 FRONT MOUNT PUMP
THROTTLE ADV (rpm) 1350 PTO PUMP

ELEVATED IDLE OPTIONS = NO
ENABLE ELEVATED IDLE NEUTRAL/PARK INTERLOCK

THROTTLE LIMIT SETUP = YES ☒
ENABLE THROTTLE LIMIT = 1450
MAXIMUM THROTTLE LIMIT

FOOT PEDAL AND REMOTE THROTTLE CONTROL
ENABLE FOOT PEDAL INHIBIT SWITCH = NO

GET COPY OF CCC PROGRAM PARAMETERS FROM RW SPENCER 918-836-1651 X228, THEN CALL LOCAL JOHN DEERE DEALER TO PROGRAM ENGINE.

WIRE COLOR	FUNCTION
BROWN "800"	THROTTLE ADVANCE
BROWN "801"	THROTTLE LIMIT
WHITE "GND"	GROUND
BROWN 801	PIN #7 IN JOHN DEERE 12 PIN CONNECTOR

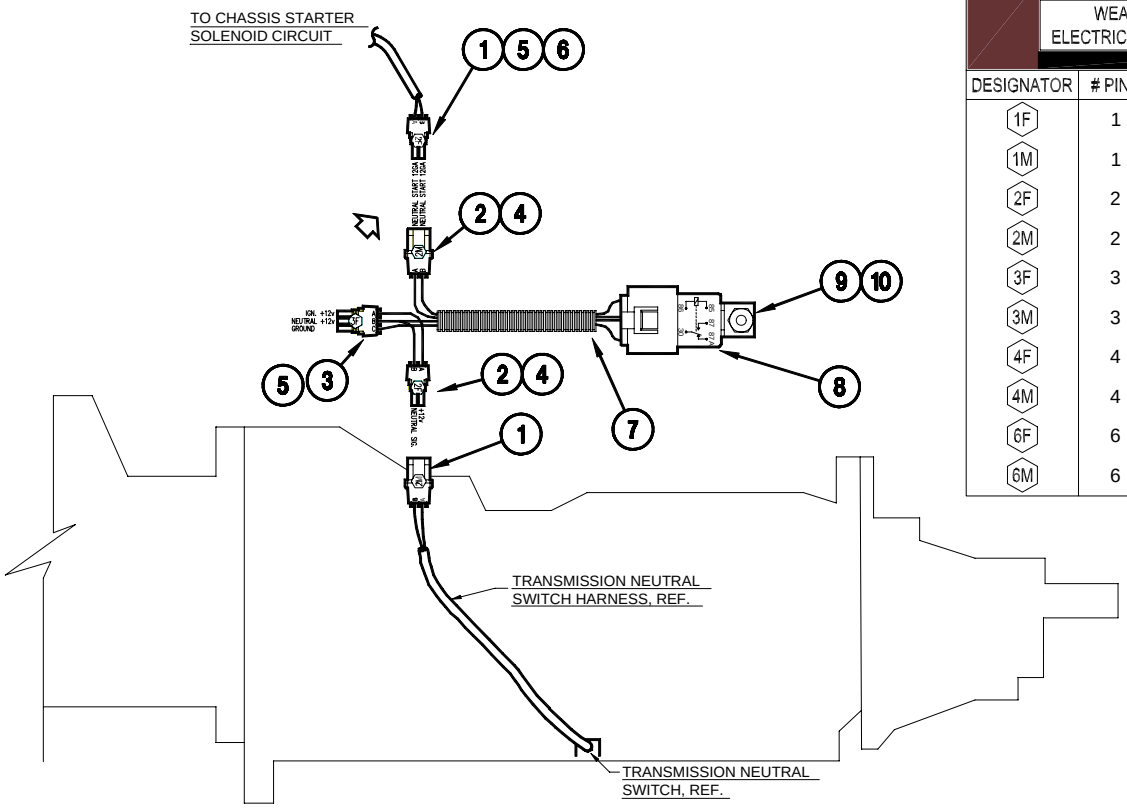
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THROTTLE ADVANCE KIT for ELECTRONIC CONTROLLED CRANE CARRIER w/J. DEERE ENGINE 272-8539-009

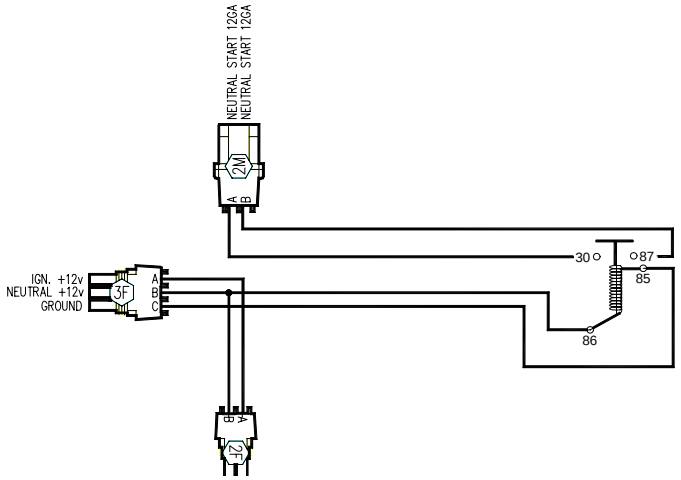
REF	PART NO.	DESCRIPTION	REQ'D
1	069-0032	KIT, micro relay – (see section 6)	2
2	036-1581	TIE, plastic	10
3	047-2151-001	SCREW, tek	2
4	108-4827-005	CONNECTOR, 3-way male	1
5	108-4827-111	TERMINAL, male	3
6	108-4827-131	SEAL, cable	3
7	108-5034-003	LOOM, electrical	12 ft
8	108-6761-800	WIRE – 16 GA (brown "800")	12 ft
9	108-6761-801	WIRE – 16 GA (brown "801")	12 ft
10	108-6761-GND	WIRE – 16 GA (white "GND")	2 ft
11	212-2773-013	DECAL	1
12	212-2777-014	DECAL, throttle limit	1

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NEUTRAL SWITCH KIT for AUTOMATIC TRANSMISSION (NON-ELECTRONIC)
272-3183-001



WEATHER PACK ELECTRICAL CONNECTORS			
DESIGNATOR	# PINS	GENDER	PACKARD #
1F	1	FEMALE	12015791
1M	1	MALE	12010996
2F	2	FEMALE	12015792
2M	2	MALE	12010973
3F	3	FEMALE	12015793
3M	3	MALE	12010717
4F	4	FEMALE	12015797
4M	4	MALE	12010974
6F	6	FEMALE	12015799
6M	6	MALE	12010975



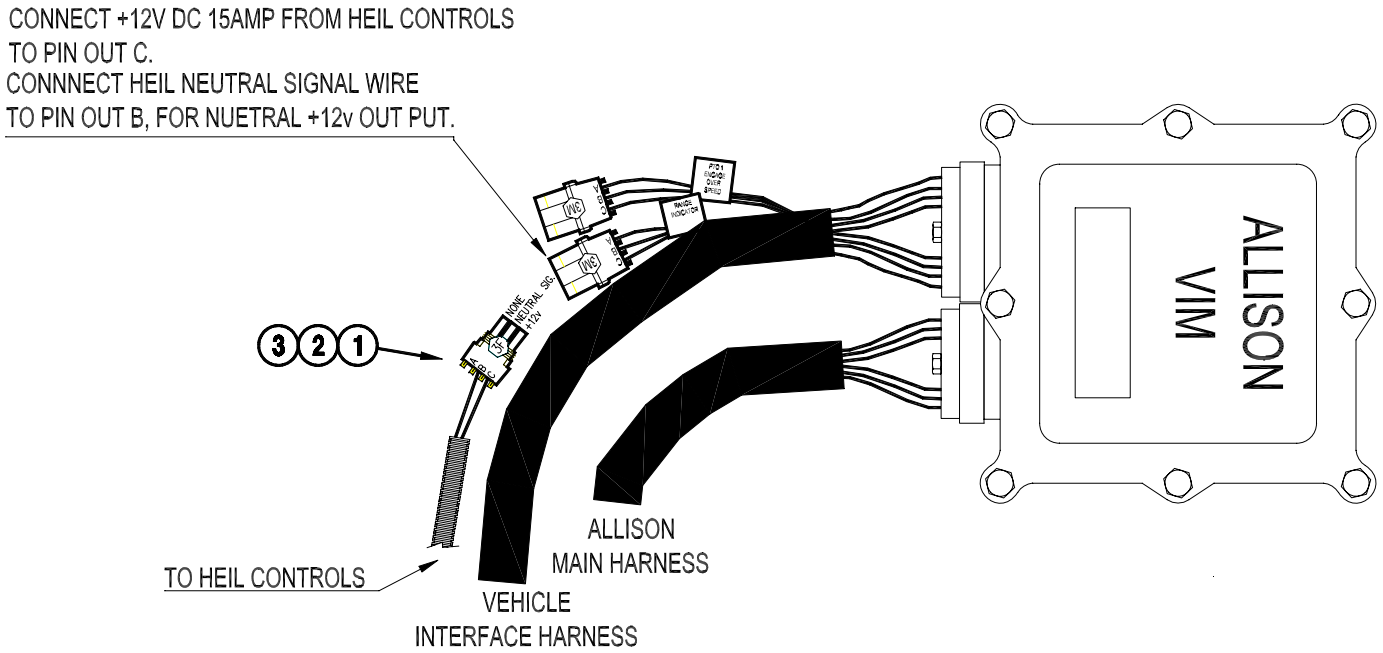
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NEUTRAL SWITCH KIT for AUTOMATIC TRANSMISSION (NON-ELECTRONIC)
272-3183-001

REF	PART NO.	DESCRIPTION	REQ'D
1	108-4827-004	PLUG, 2-way female	2
2	108-4827-003	PLUG, 2-way male	2
3	108-4827-006	PLUG, 3-way female	1
4	108-4827-011	TERMINAL, male	4
5	108-4827-012	TERMINAL, female	7
6	108-4827-013	SEAL, cable	11
7	108-4476	LOOM	1ft
8	108-6752	RELAY	1
9	FS070715	CAPSCREW – 1/4" – 20NC x 3/4"	1
10	FS230700	NUT, lock – 1/4" –20NC	1

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NEUTRAL SWITCH KIT for 320 PTERBILT CHASSIS with ALLISON WORLD TRANSMISSION
272-3183-003



WEATHER PACK ELECTRICAL CONNECTORS			
DESIGNATOR	# PINS	GENDER	PACKARD #
1F	1	FEMALE	12015791
1M	1	MALE	12010996
2F	2	FEMALE	12015792
2M	2	MALE	12010973
3F	3	FEMALE	12015793
3M	3	MALE	12010717
4F	4	FEMALE	12015797
4M	4	MALE	12010974
6F	6	FEMALE	12015799
6M	6	MALE	12010975

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NEUTRAL SWITCH KIT for 320 PTERBILT CHASSIS with ALLISON WORLD TRANSMISSION 272-3183-003

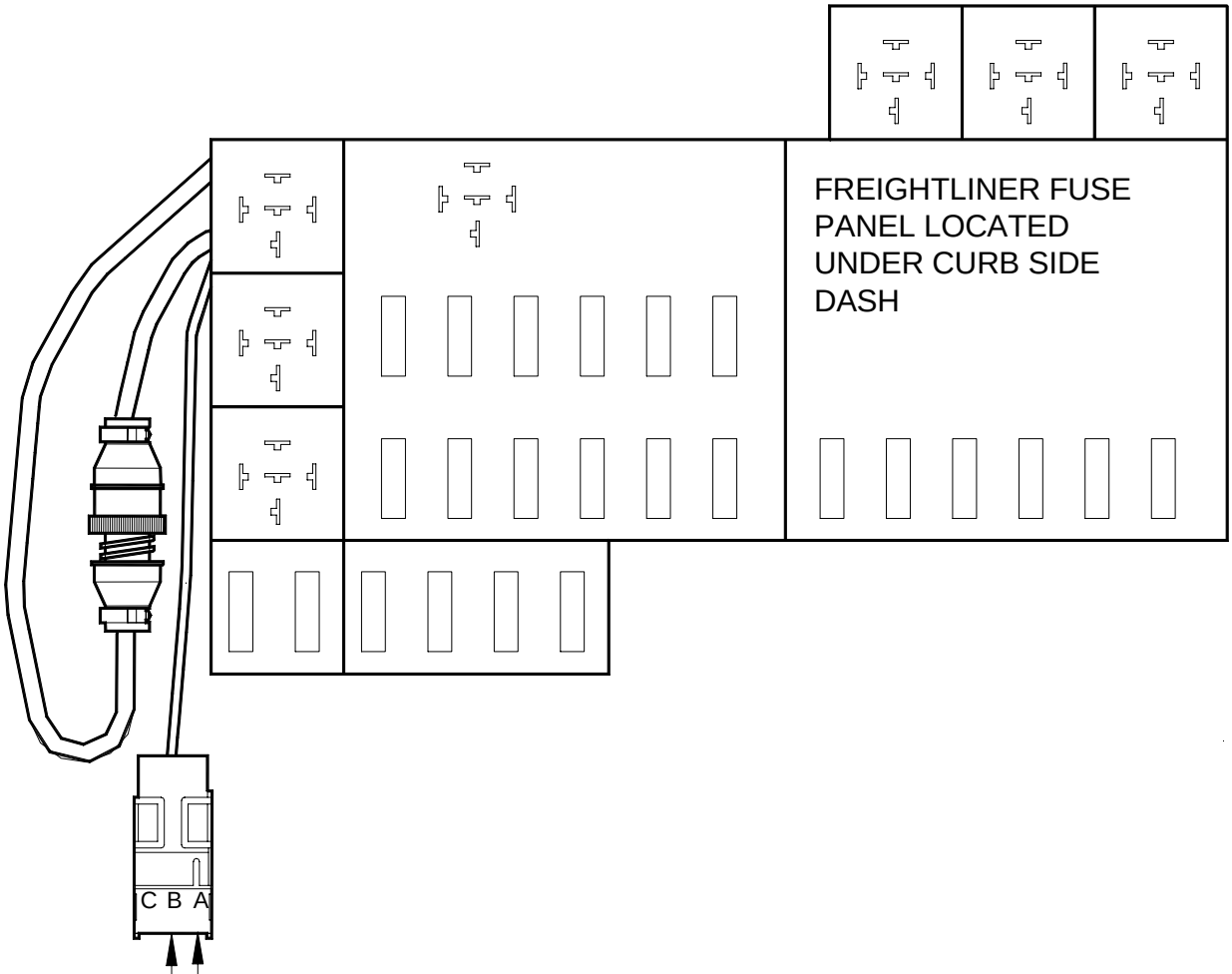
REF	PART NO.	DESCRIPTION	REQ'D
1	108-4827-006	CONNECTOR, 3-way female	1
2	108-4827-012	TERMINAL, female	2
3	108-4827-013	SEAL, cable	2

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NEUTRAL SWITCH KIT for FREIGHTLINER CHASSIS and ALLISON WORLD TRANSMISSION 272-3183-005



NOTE: INSERT TERMINAL INTO REAR OF CONNECTOR.

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NEUTRAL SWITCH KIT for FREIGHTLINER CHASSIS and ALLISON WORLD TRANSMISSION 272-3183-005

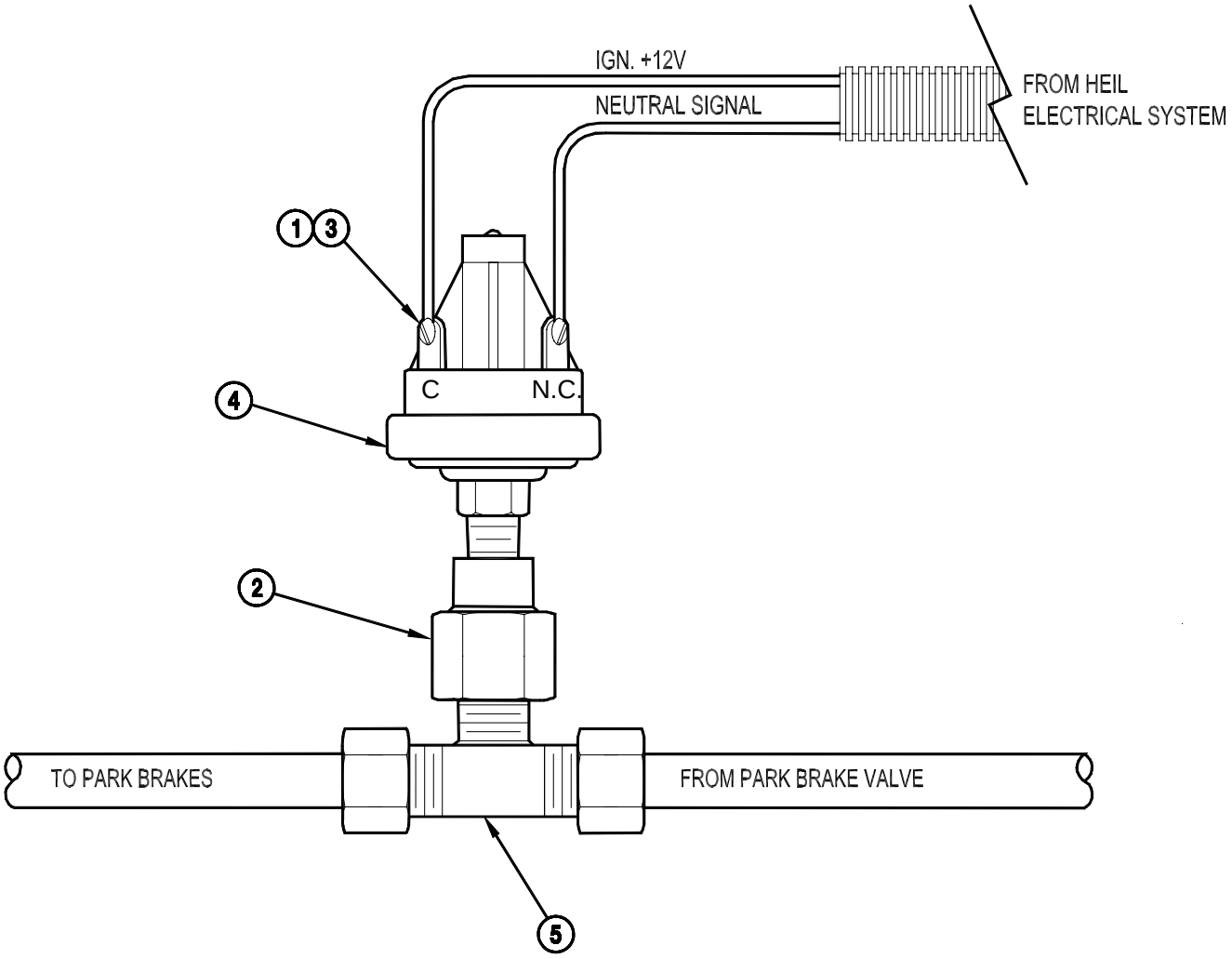
REF	PART NO.	DESCRIPTION	REQ'D
1	108-6783	TERMINAL, packard	2

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NEUTRAL SWITCH KIT for MANUAL TRANSMISSION
272-3183-007



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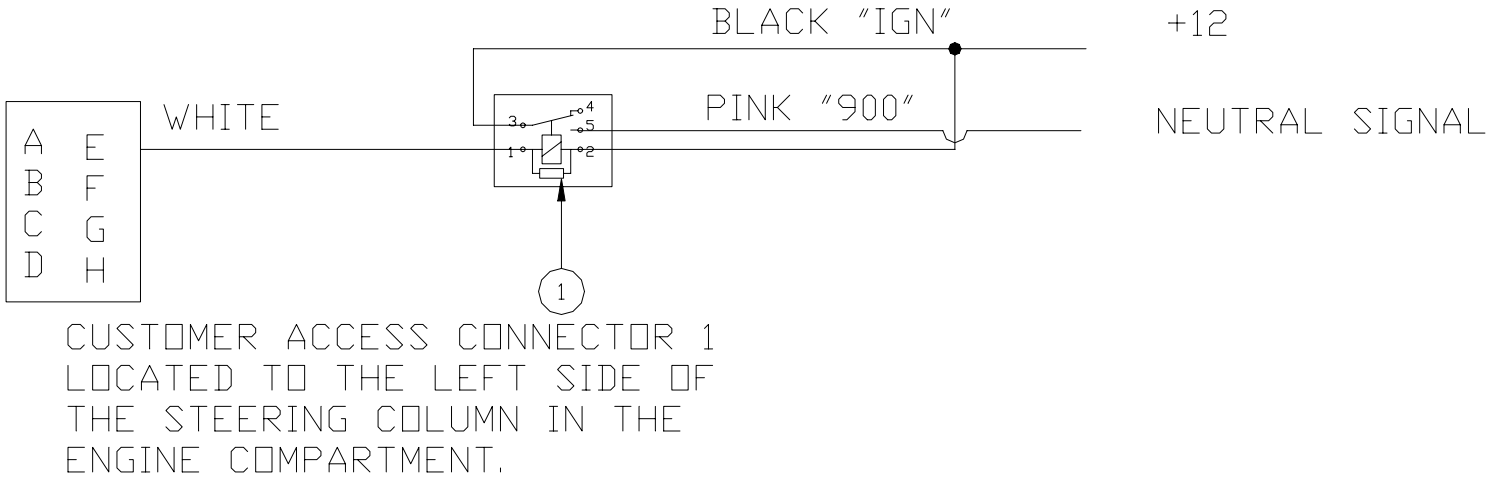
FORMULA 5000

NEUTRAL SWITCH KIT for MANUAL TRANSMISSION
272-3183-007

REF	PART NO.	DESCRIPTION	REQ'D
1	054-7350	TUBING, shrink	2"
2	054-8881-003	FITTING, reducer – brass	1
3	108-4943-003	TERMINAL, ring	2
4	108-5617	SWITCH, pressure – N.C.	1
5	354-0202-006	TEE, male	1

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NEUTRAL SWITCH KIT for ACTERA CHASSIS
And ALLISON WTECH TRASMISSION
272-3183-010



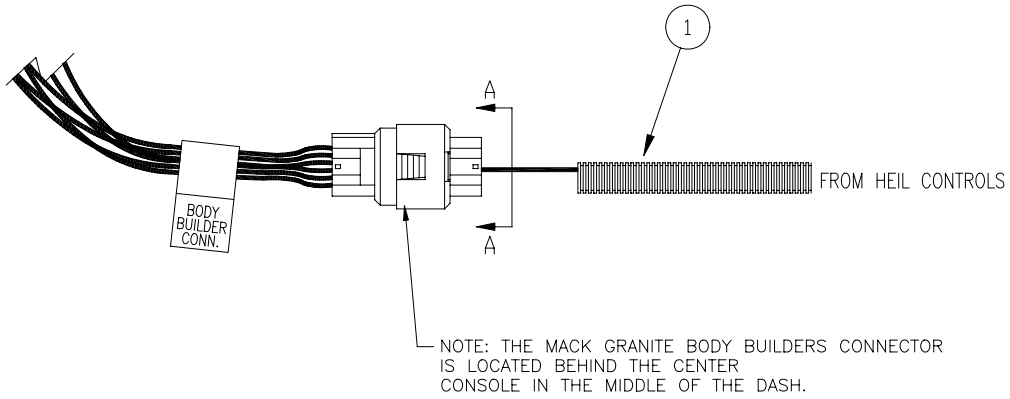
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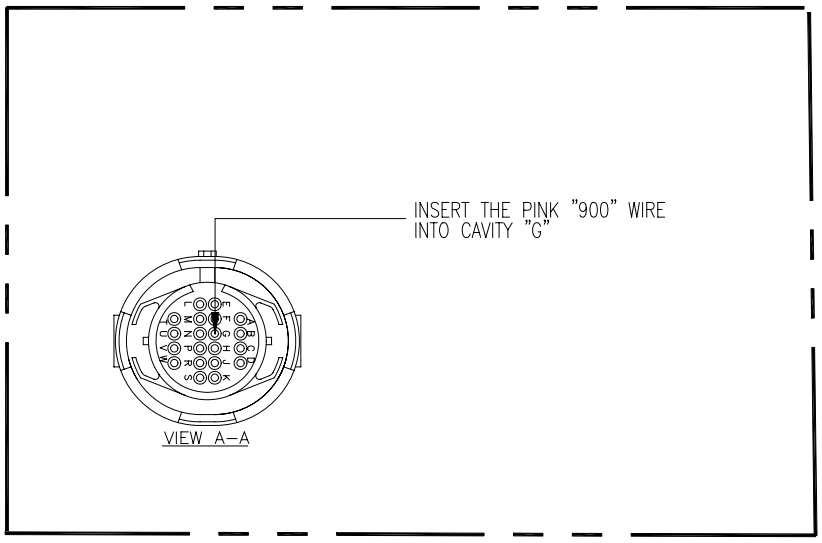
NEUTRAL SWITCH KIT for ACTERA CHASSIS And ALLISON WTECH TRASMISSION 272-3183-010

REF	PART NO.	DESCRIPTION	REQ'D
1	069-0032	RELAY KIT (see section 6)	1
2	047-2151-001	SCREW, tech	1
3	108-4470	LOOM, electrical	6 ft
4	108-5233-022	WIRE – 16 GA - WHITE	5 ft
5	108-6716-IGN	WIRE – 16 GA "IGN"	30 inches
6	108-6716-900	WIRE – 16 GA – pink "900"	30 inches
7	212-2777-008	DECAL, neutral	1

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NEUTRAL SWITCH KIT for MACK GRANITE CHASSIS
And ALLISON WORLD TRANSIMISSION
272-3183-011





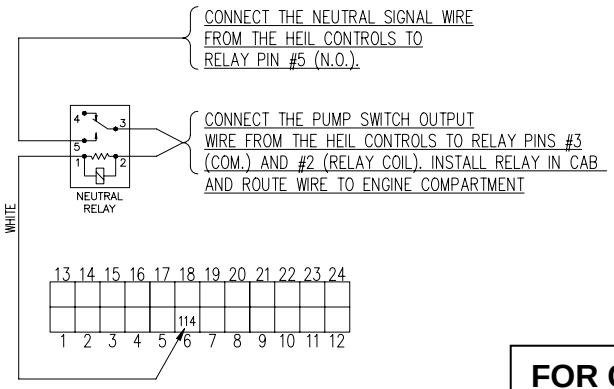
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NEUTRAL SWITCH KIT for MACK GRANITE CHASSIS And ALLISON WORLD TRANSIMISSION 272-3183-011

REF	PART NO.	DESCRIPTION	REQ'D
1	108-7148	SOCKET	3

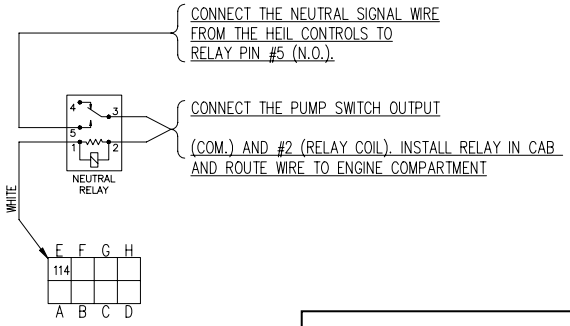
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NEUTRAL SWITCH KIT for NAVISTAR NGV CHASSIS And ALLISON WTECH TRASMISSION 272-3183-103



THE NGV CHASSIS WITH AUTO NEUTRAL HAS A 24 PIN (2 ROWS OF 12) CONNECTOR LOCATED TO RIGHT OF THE STEERING COLUMN TOWARD THE ENGINE. SPLICE INTO WIRE 114 LEAVING THIS CONNECTOR AND RUN WIRE INTO THE CAB. INSTAl THE RELAY AND ASSOCIATED WIRING IN THE CAB.

FOR CHASSIS WITH AUTO-NEUTRAL



THE NGV CHASSIS WITHOUT AUTO NEUTRAL HAS A 8 PIN (4 ROWS OF 12) CONNECTOR LOCATED TO THE RIGHT OF THE STEERING COLUMN TOWARD THE ENGINE. SPLICE INTO WIRE 114 LEAVING THIS CONNECTOR AND RUN WIRE INTO THE CAB. INSTALL THE RELAY AND ASSOCIATED WIRING IN THE CAB.

FOR CHASSIS WITHOUT AUTO-NEUTRAL

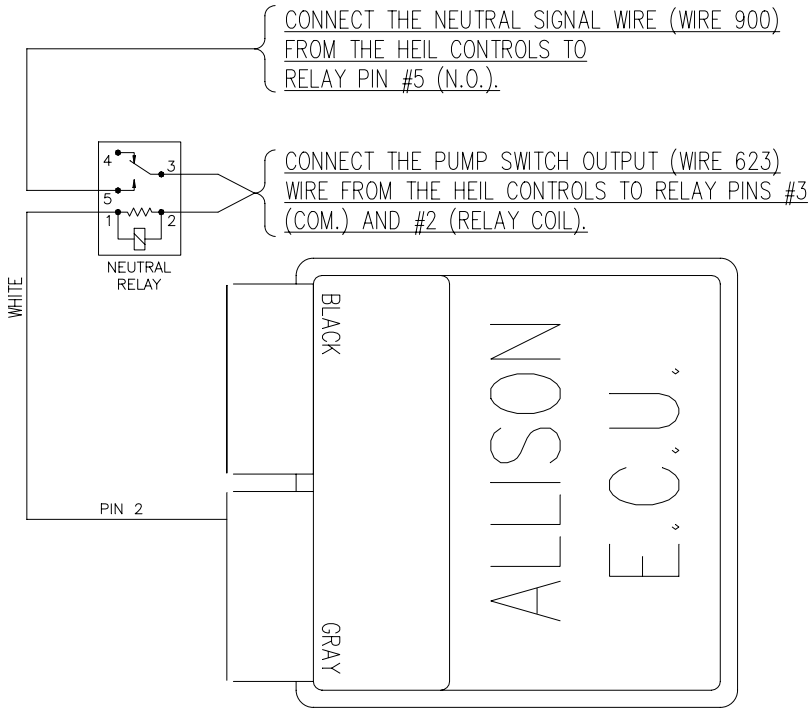
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NEUTRAL SWITCH KIT for NAVISTAR NGV CHASSIS And ALLISON WTECH TRASMISSION 272-3183-103

REF	PART NO.	DESCRIPTION	REQ'D
1	069-0032	RELAY KIT (see section 6)	1
2	047-2151-001	SCREW, tech	1
3	108-4470	LOOM, electrical	3 ft
4	108-5233-022	WIRE – 16 GA - WHITE	3 ft
5	108-5717-002	CONNECTOR, butt	3
6	108-6363	TUBE, shrink	3
7	212-2777-008	DECAL, neutral	1

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NEUTRAL SWITCH KIT – FREIGHTLINER M2 CHASSIS W/TECH III TRANSMISSION 272-3183-104



ALLISON E.C.U.

THE ECU IS LOCATED UNDER THE CAB ON THE LEFT HAND SIDE OF THE TRUCK. IT IS ON TOP OF A PLATE. THIS PLATE IS LOCATED OUTSIDE THE CHASSIS RAILS BETWEEN THE FRONT LEFT WHEEL AND THE BUMPER.

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NEUTRAL SWITCH KIT – FREIGHTLINER M2 CHASSIS W/TECH III TRANSMISSION 272-3183-104

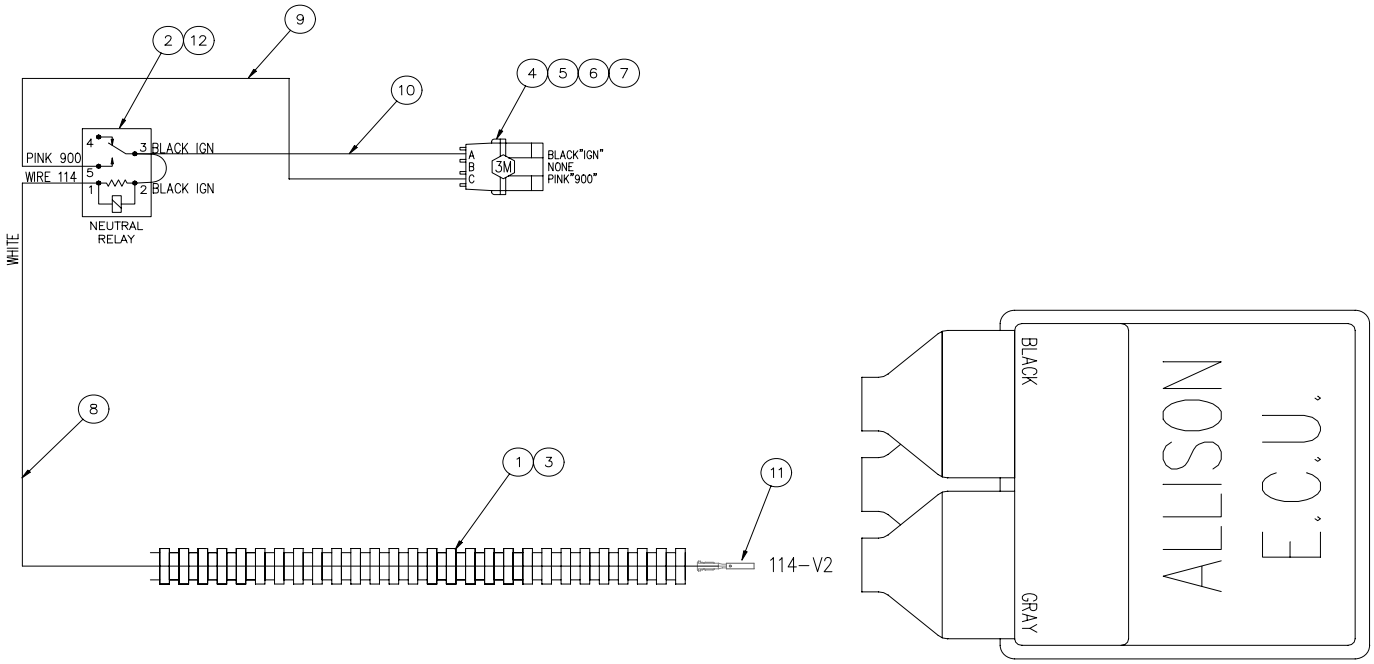
REF	PART NO.	DESCRIPTION	REQ'D
1	047-2151-001	SCREW, tek	1
2	069-0032	RELAY (see section 6)	1
3	108-4470	LOOM	3 FT
4	108-5233-017	WIRE – 16GA – black	3 FT
5	108-7114-004	TERMINAL, ECU	2
6	212-2777-017	DECAL pump overspeed	1

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NEUTRAL SWITCH KIT for ALLISON GEN 3 3000RDS TRANSMISSION
272-3183-106



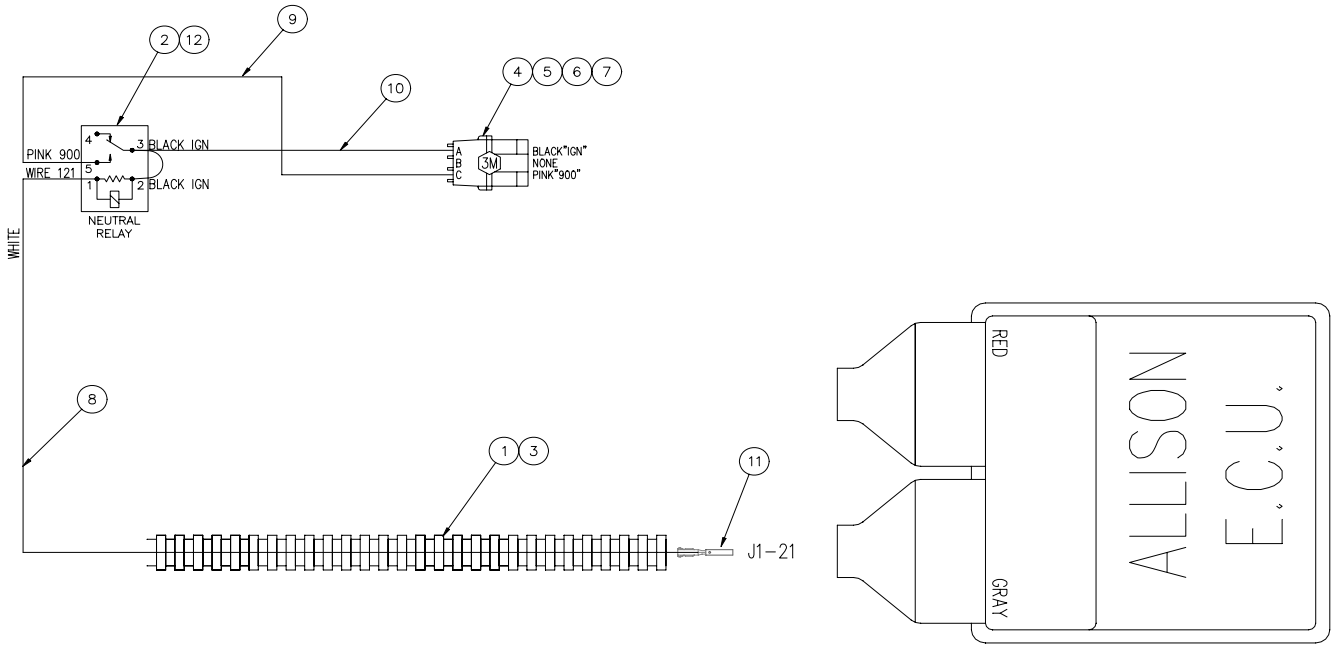
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NEUTRAL SWITCH KIT for ALLISON GEN 3 3000RDS TRANSMISSION
272-3183-106

REF	PART NO.	DESCRIPTION	REQ'D
1	036-1581	TIE, plastic	10
2	069-0032	RELAY, micro (see section 6)	1
3	108-4476	LOOM, split	15 ft.
4	108-4827-005	CONNECTOR, 3-way male	1
5	108-4827-111	TERMINAL, male	3
6	108-4827-131	SEAL, cable	3
7	108-4827-133	PLUG, cavity	2
8	108-5233-022	WIRE – 16AWG – white	12 ft.
9	108-6716-900	WIRE – 16AWG – pink "900"	3 ft.
10	108-6716-IGN	WIRE – 16AWG – black "IGN"	40 inches
11	108-7114-004	PIN	2
12	212-2777-008	DECAL, neutral	1

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NEUTRAL SWITCH KIT for ALLISON GEN 3 1000, 2000RDS TRANSMISSION
272-3183-107



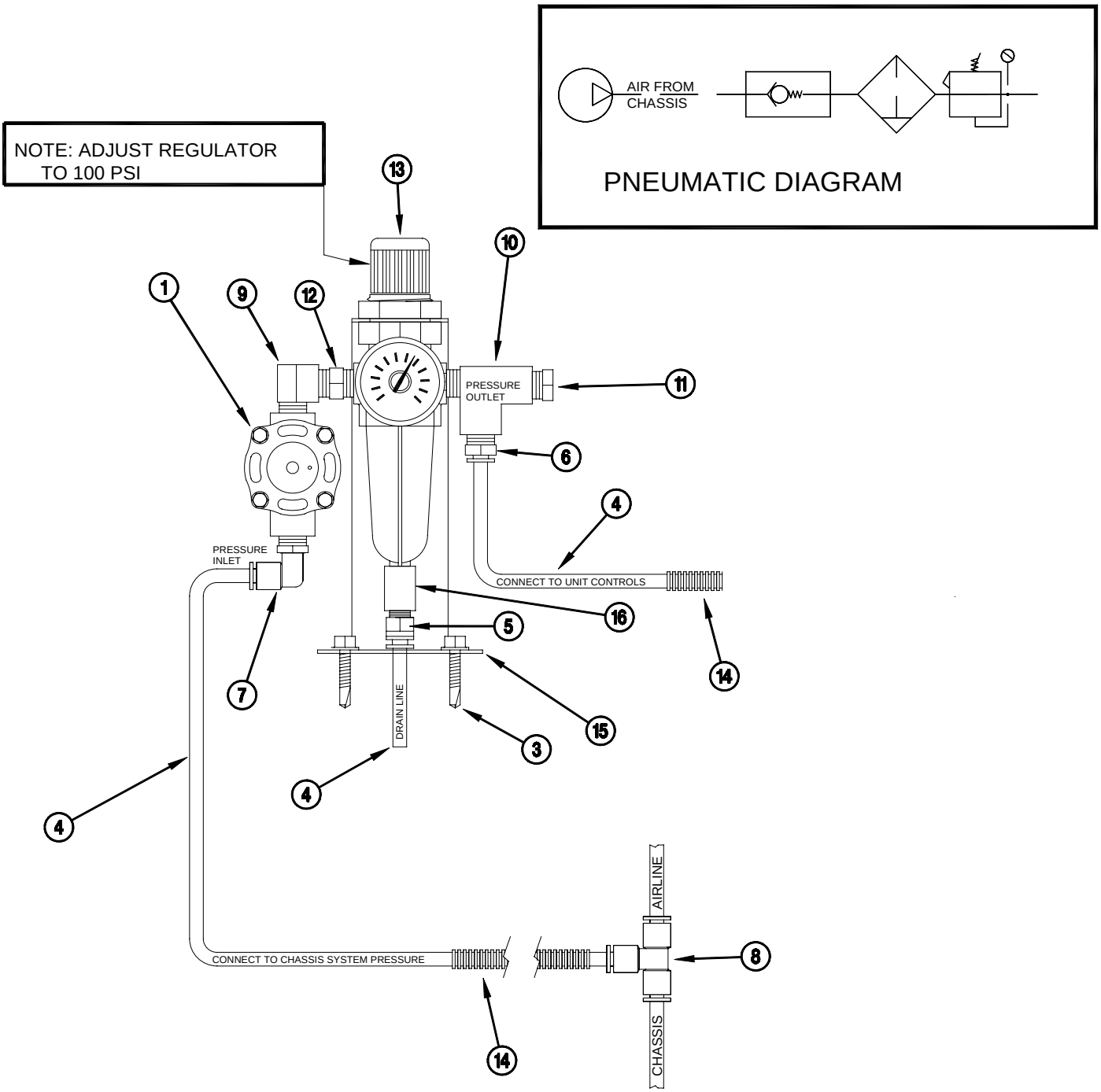
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NEUTRAL SWITCH KIT for ALLISON GEN 3 1000, 2000RDS TRANSMISSION 272-3183-107

REF	PART NO.	DESCRIPTION	REQ'D
1	036-1581	TIE, plastic	10
2	069-0032	RELAY, micro (see section 6)	1
3	108-4476	LOOM, split	15 ft.
4	108-4827-005	CONNECTOR, 3-way male	1
5	108-4827-111	TERMINAL, male	3
6	108-4827-131	SEAL, cable	3
7	108-4827-133	PLUG, cavity	2
8	108-5233-022	WIRE – 16AWG – white	12 ft.
9	108-6716-900	WIRE – 16AWG – pink "900"	3 ft.
10	108-6716-IGN	WIRE – 16AWG – black "IGN"	40 inches
11	108-7114-004	PIN	2
12	212-2777-008	DECAL, neutral	1

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AIR SUPPLY PARTS for 272-7464-01



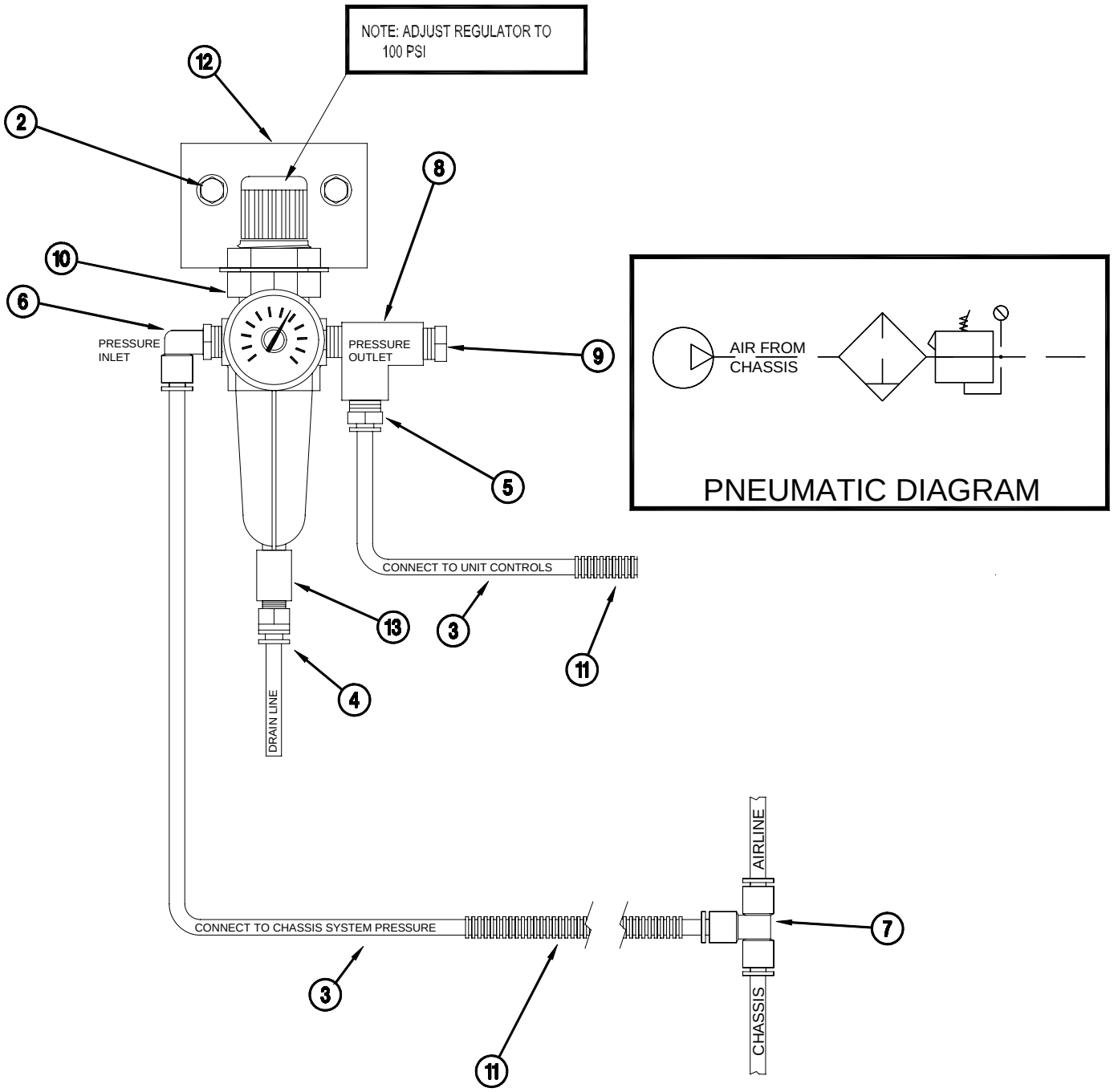
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AIR SUPPLY PARTS for 272-7464-01

REF	PART NO.	DESCRIPTION	REQ'D
1	031-1909	VALVE, pressure protection	1
2	036-1115	CLAMP, strap	30
3	047-2151-011	SCREW, tek – 1/4"	2
4	054-5449	TUBE – 1/4"	20ft
5	054-8468-003	CONNECTOR – 1/8" pipe x 1/4" tube	1
6	054-8468-004	CONNECTOR – 1/4" pipe x 1/4" tube	1
7	054-8470-004	ELBOW, 90° 1/4" pipe x 1/4" tube	1
8	054-8472-002	TEE – 1/4"	1
9	054-8739-002	ELBOW, 90° street – 1/4" NPT	1
10	054-8740-002	TEE, street	1
11	054-8925-002	PLUG, pipe – 1/4"	1
12	054-8927-002	NIPPLE, pipe – 1/4"	1
13	075-0721	FILTER/REGULATOR – with gauge	1
14	108-4498	LOOM, electrical	20ft
15	211-9966	BRACKET, filter/regulator	1
16	FS640400	COUPLING, pipe	1

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AIR SUPPLY PARTS for 272-7464-002



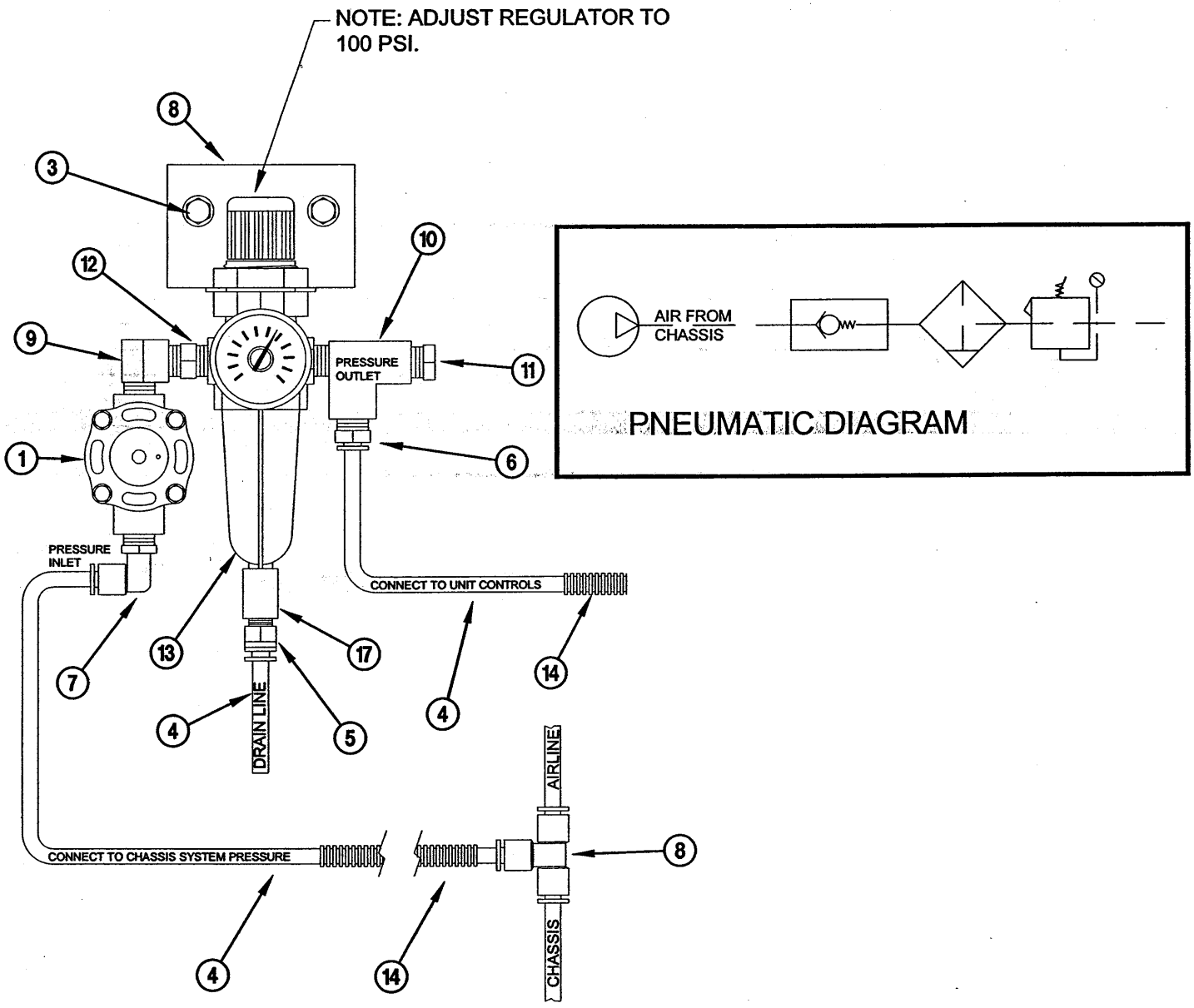
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AIR SUPPLY PARTS for 272-7464-002

REF	PART NO.	DESCRIPTION	REQ'D
1	036-1115	CLAMP, strap	30
2	047-2151-011	SCREW, tek – 1/4"	2
3	054-5449	TUBE – 1/4"	20ft
4	054-8468-003	CONNECTOR – 1/8" pipe x 1/4" tube	1
5	054-8468-004	CONNECTOR – 1/4" pipe x 1/4" tube	1
6	054-8470-004	ELBOW, 90° 1/4" pipe x 1/4" tube	1
7	054-8472-002	TEE – 1/4"	1
8	054-8740-002	TEE, street	1
9	054-8925-002	PLUG, pipe – 1/4"	1
10	075-0721	FILTER/REGULATOR – with gauge	1
11	108-4498	LOOM, electrical	20ft
12	211-9967	BRACKET, filter/regulator	1
16	FS640400	COUPLING, pipe	1

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AIR SUPPLY PARTS for 272-7464-003



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AIR SUPPLY PARTS for 272-7464-003

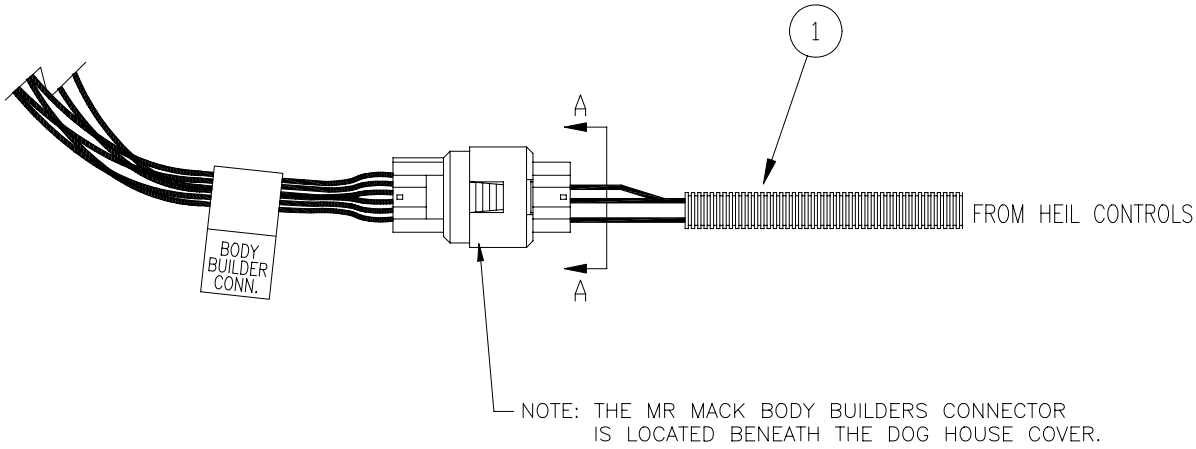
REF	PART NO.	DESCRIPTION	REQ'D
1	031-1909	VALVE, pressure protection	1
2	036-1115	CLAMP, strap	30
3	047-2151-011	SCREW, tek – 1/4"	2
4	054-5449	TUBE – 1/4"	20ft
5	054-8468-003	CONNECTOR – 1/8" pipe x 1/4" tube	1
6	054-8468-004	CONNECTOR – 1/4" pipe x 1/4" tube	1
7	054-8470-004	ELBOW, 90° 1/4" pipe x 1/4" tube	3
8	054-8472-002	TEE – 1/4"	1
9	054-8739-002	ELBOW, 90° street – 1/4" NPT	1
10	054-8740002	TEE, street	1
11	054-8925-002	PLUG, pipe – 1/4"	1
12	054-8927-002	NIPPLE, pipe – 1/4"	1
13	075-0721	FILTER/REGULATOR – with gauge	1
14	108-4498	LOOM, electrical	20ft
15	211-9967	BRACKET, filter/regulator	1
16	FS640400	COUPLING, pipe	1

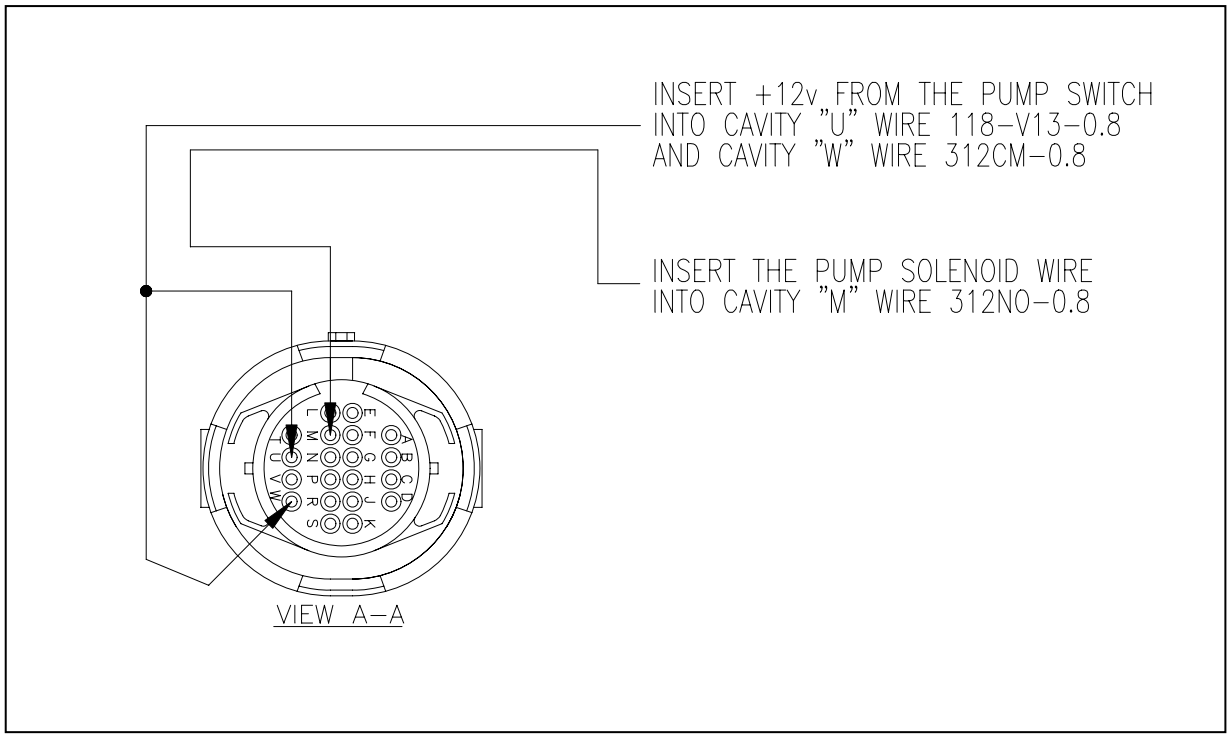
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(EOS) ELECTRONIC OVERSPEED SWITCH KIT
ALLISON WORLD TRANSMISSION MR MACK CHASSIS
MACK MR - 272-7738-011
MACK GRANITE – 272-7738-014





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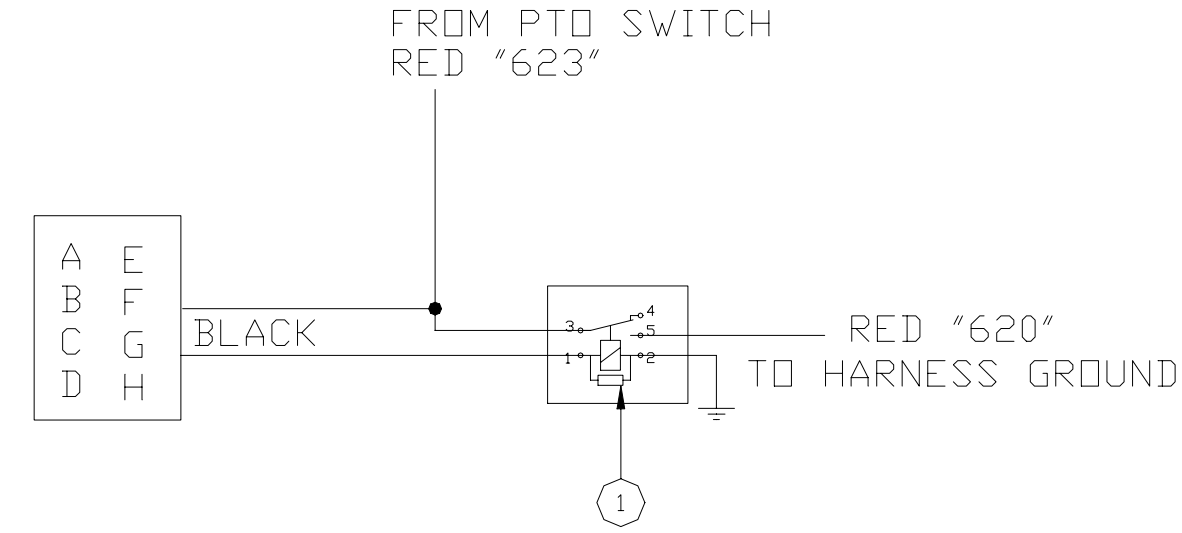
FORMULA 5000

(EOS) ELECTRONIC OVERSPEED SWITCH KIT
ALLISON WORLD TRANSMISSION MR MACK CHASSIS
MACK MR - 272-7738-011
MACK GRANITE – 272-7738-014

REF	PART NO.	DESCRIPTION	REQ'D
1	108-7148	SOCKET	3

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ALLISON WT TRANSMISSION 272-7738-013



CUSTOMER ACCESS CONNECTOR 1
LOCATED TO THE LEFT SIDE OF
THE STEERING COLUMN IN THE
ENGINE COMPARTMENT.

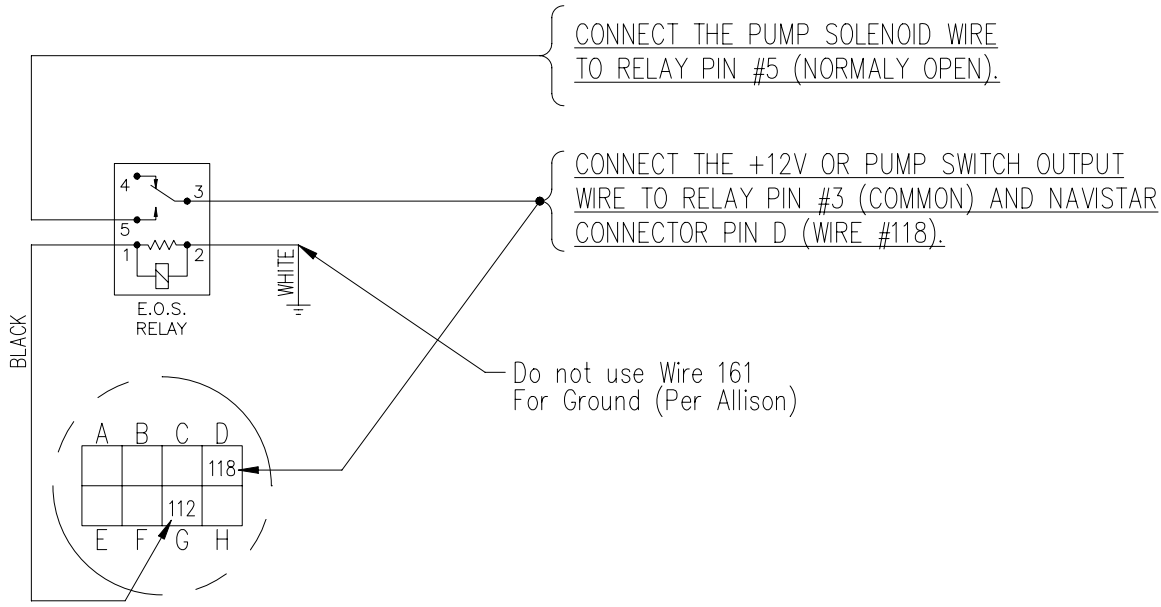
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(EOS) ELECTRONIC OVERSPEED SWITCH KIT
ALLISON WT TRANSMISSION 272-7738-013

REF	PART NO.	DESCRIPTION	REQ'D
1	069-0032	RELAY (see section 6)	1
2	047-2151-001	SCREW, tek	1
3	108-4470	LOOM	6
4	108-5233-017	WIRE – 16GA – black	60 inches
5	108-6716-623	WIRE – 18GA – red "623"	30 inches
6	108-6717-620	WIRE – 18GA – red "620"	30 inches
7	212-2777-017	DECAL pump overspeed	1

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(EOS) ELECTRONIC OVERSPEED SWITCH KIT
W/TECH III TRANSMISSION – NGV CHASSIS
272-7738-101



THE NGV CHASSIS HAS A 8 PIN (2 ROWS OF 4) CONNECTOR LOCATED TO THE RIGHT OF THE STEERING COLUMN TOWARD THE ENGINE. SPLICE INTO WIRES 114 AND 118 LEAVING THIS CONNECTOR AND RUN WIRES INTO THE CAB. INSTALL THE RELAY AND ASSOCIATED WIRING IN THE CAB.

PROGRAMMING PARAMETERS FOR WT TRANS. E.O.S.		
EQUIPMENT REQUIRED – PC W/ALLISON PC DOC SOFTWARE		
ENABLE/DISABLE WIRE 112	=	ENABLE
MAX. ENGINE SPEED FOR PTO ENGAGEMENT	=	900 RPM
MAX. ENGINE SPEED FOR PTO OPERATION	=	**** RPM
MAX. OUTPUT SPEED FOR PTO ENGAGEMENT	=	5000 RPM
MAX. OUTPUT SPEED FOR PTO OPERATION	=	5000 RPM
*** = THROTTLE ADVANCE + 200 RPM (NOT EXCEED 1800 RPM WITHOUT ENGINEERING APPROVAL)		

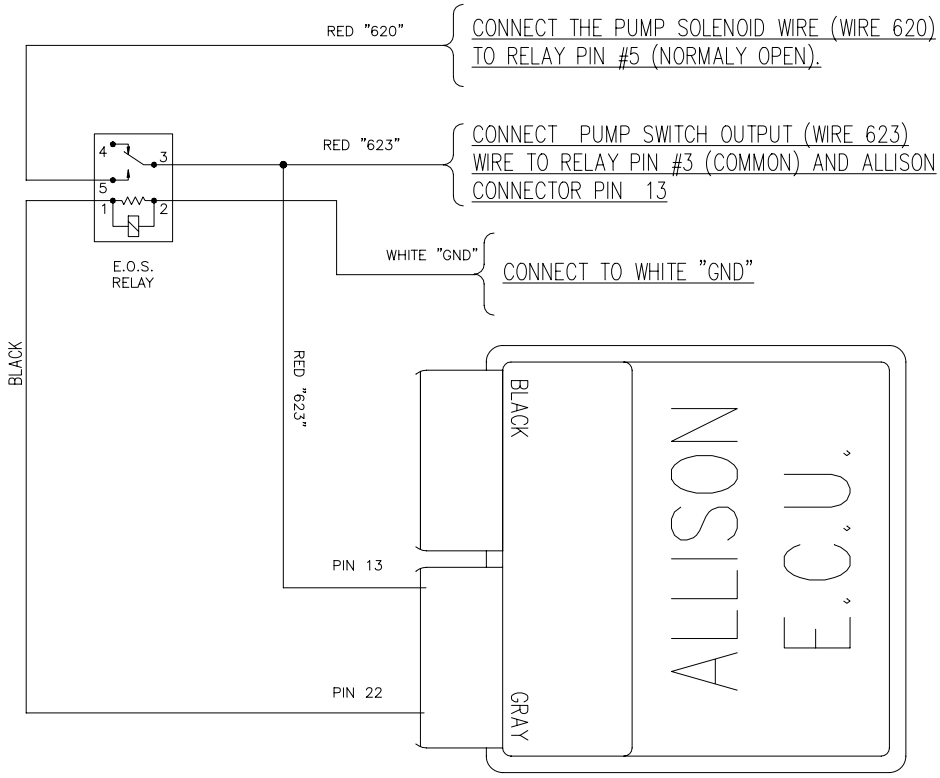
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(EOS) ELECTRONIC OVERSPEED SWITCH KIT W/TECH III TRANSMISSION – NGV CHASSIS 272-7738-101

REF	PART NO.	DESCRIPTION	REQ'D
1	047-2151-001	SCREW, tek	1
2	069-0032	RELAY (see section 6)	1
3	108-4470	LOOM	3 FT
4	108-5233-017	WIRE – 16GA – black	3 FT
5	108-5233-022	WIRE – 16GA – white	3 FT
6	212-2777-017	DECAL pump overspeed	1

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(EOS) ELECTRONIC OVERSPEED SWITCH KIT
W/TECH III TRANSMISSION – FREIGHTLINER M2 CHASSIS
272-7738-102



ALLISON E.C.U.

PROGRAMMING PARAMETERS FOR WT TRANS. E.O.S.		
EQUIPMENT REQUIRED – PC W/ALLISON PC DOC SOFTWARE		
ENABLE/DISABLE WIRE 112	=	ENABLE
MAX. ENGINE SPEED FOR PTO ENGAGEMENT	=	900 RPM
MAX. ENGINE SPEED FOR PTO OPERATION	=	**** RPM
MAX. OUTPUT SPEED FOR PTO ENGAGEMENT	=	5000 RPM
MAX. OUTPUT SPEED FOR PTO OPERATION	=	5000 RPM
*** = THROTTLE ADVANCE + 200 RPM		
(NOT EXCEED 1800 RPM WITHOUT ENGINEERING APPROVAL)		

THE ECU IS LOCATED UNDER THE CAB ON THE LEFT HAND SIDE OF THE TRUCK. IT IS ON TOP OF A PLATE. THIS PLATE IS LOCATED OUTSIDE THE CHASSIS RAILS BETWEEN THE FRONT LEFT WHEEL AND THE BUMPER.

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(EOS) ELECTRONIC OVERSPEED SWITCH KIT W/TECH III TRANSMISSION – FREIGHTLINER M2 CHASSIS 272-7738-102

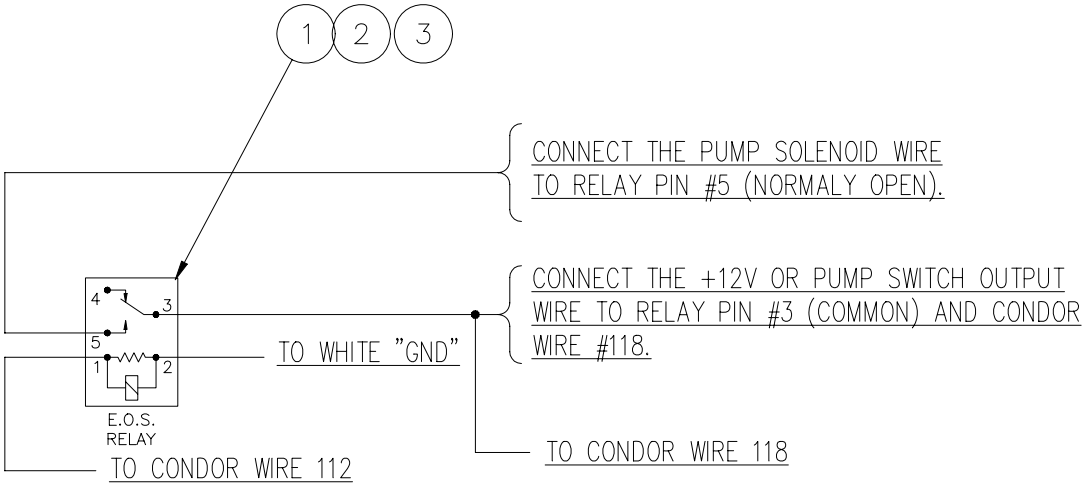
REF	PART NO.	DESCRIPTION	REQ'D
1	047-2151-001	SCREW, tek	1
2	069-0032	RELAY (see section 6)	1
3	108-4470	LOOM	3 FT
4	108-5233-017	WIRE – 16GA – black	3 FT
5	108-7114-004	TERMINAL, ECU	2
6	212-2777-017	DECAL pump overspeed	1

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(EOS) ELECTRONIC OVERSPEED SWITCH KIT
WORLD TRANSMISSION – CONDOR CHASSIS
272-7738-103



PROGRAMMING PARAMETERS FOR WT TRANS. E.O.S.		
EQUIPMENT REQUIRED – PC W/ALLISON PC DOC SOFTWARE		
ENABLE/DISABLE WIRE 112	=	ENABLE
MAX. ENGINE SPEED FOR PTO ENGAGEMENT	=	900 RPM
MAX. ENGINE SPEED FOR PTO OPERATION	=	**** RPM
MAX. OUTPUT SPEED FOR PTO ENGAGEMENT	=	5000 RPM
MAX. OUTPUT SPEED FOR PTO OPERATION	=	5000 RPM
*** = THROTTLE ADVANCE + 200 RPM		
(NOT EXCEED 1800 RPM WITHOUT ENGINEERING APPROVAL)		

NOTE:
THE CONDOR WIRING IS LOCATED UNDER THE MIDDLE COVER AT THE REAR GLASS AREA IN THE CAB.

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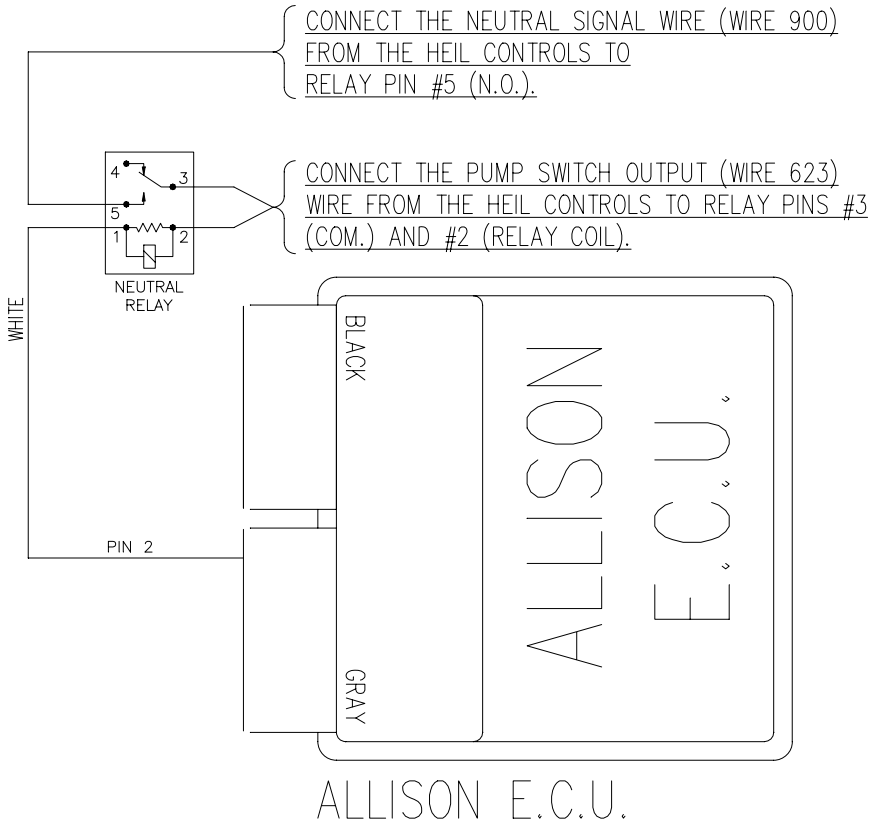
FORMULA 5000

(EOS) ELECTRONIC OVERSPEED SWITCH KIT
WORLD TRANSMISSION – CONDOR CHASSIS
272-7738-103

REF	PART NO.	DESCRIPTION	REQ'D
1	069-0032	RELAY (see section 6)	1
2	047-2151-001	SCREW, tek	1
3	212-2777-017	DECAL pump overspeed	1

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NEUTRAL SWITCH KIT for FREIGHTLINER M2 CHASSIS
ALLISON WORLD TRANSIMISSION
272-3183-104



ALLISON E.C.U.

THE ECU IS LOCATED UNDER THE CAB ON THE LEFT HAND SIDE OF THE TRUCK. IT IS ON TOP OF A PLATE. THIS PLATE IS LOCATED OUTSIDE THE CHASSIS RAILS BETWEEN THE FRONT LEFT WHEEL AND THE BUMPER.

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NEUTRAL SWITCH KIT for FREIGHTLINER M2 CHASSIS ALLISON WORLD TRANSIMISSION 272-3183-104

REF	PART NO.	DESCRIPTION	REQ'D
1	047-2151-001	SCREW, tek	1
2	069-0032	RELAY KIT (see section 6)	1
3	108-4470	LOOM, electrical	3 ft
4	108-5233-022	WIRE – 16 GA - white	3 ft
5	108-7114-004	TERMINAL	1
6	212-2777-008	DECAL, neutral	1

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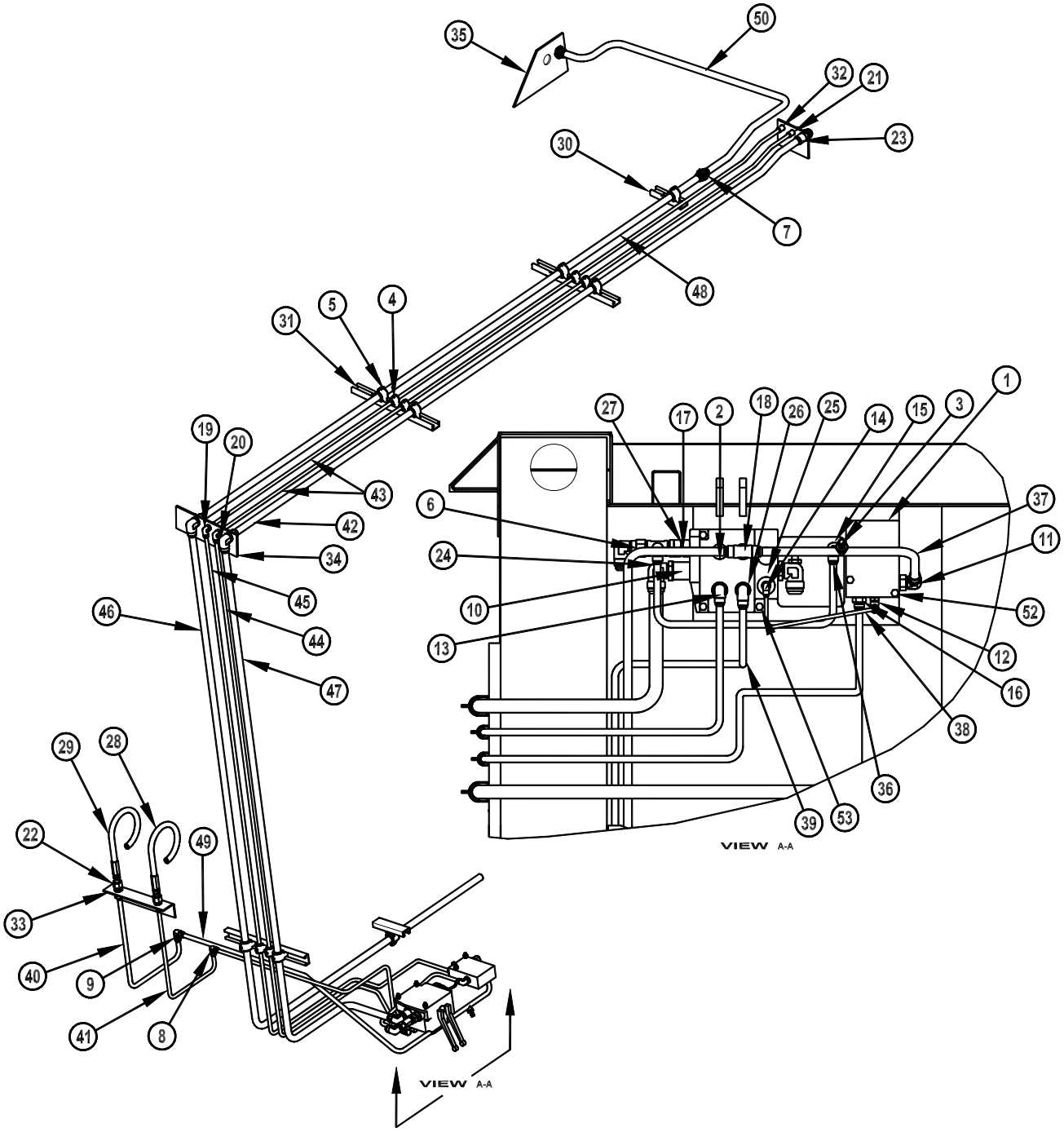
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BODY HYDRAULICS



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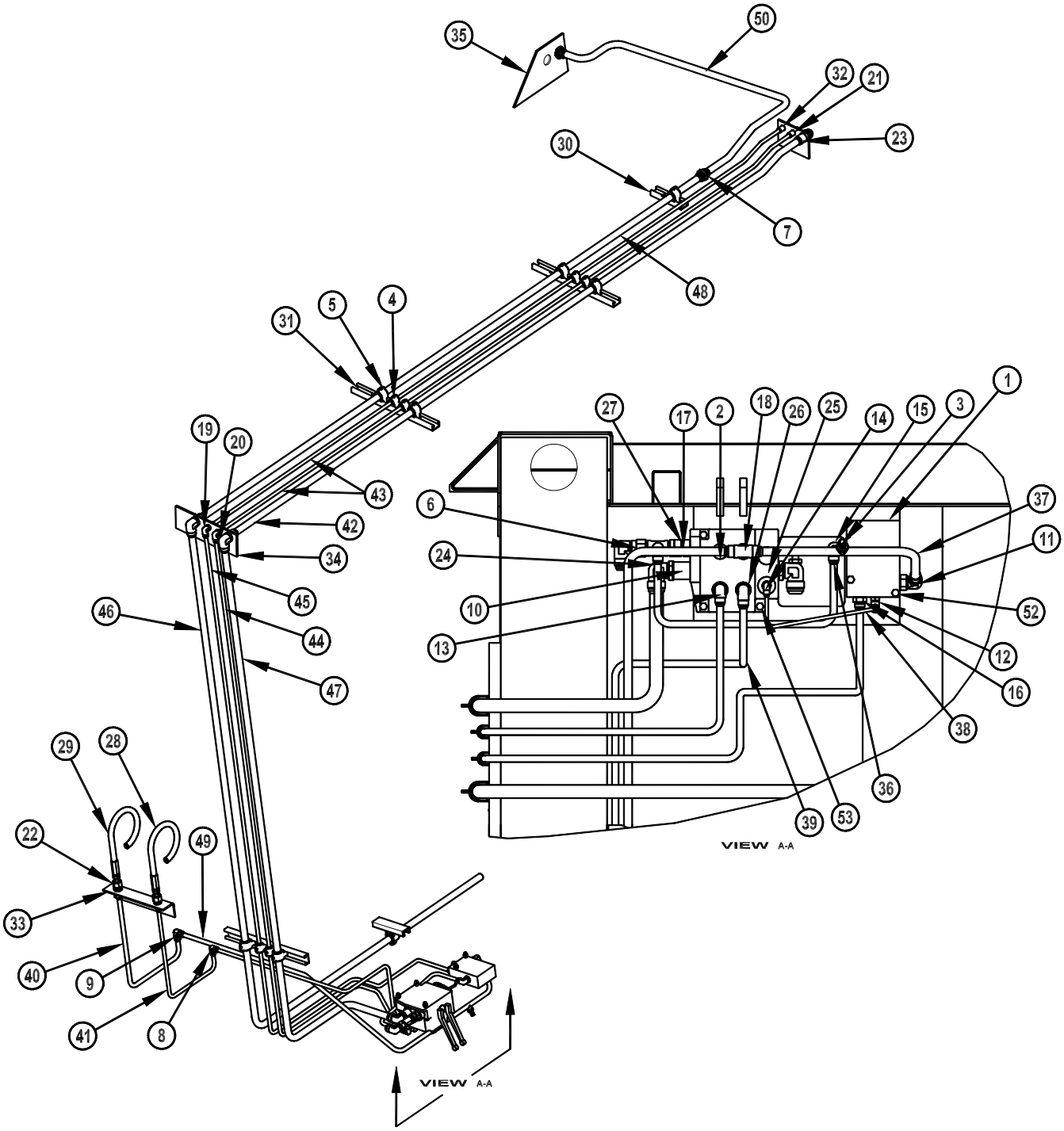
FORMULA 5000

BODY HYDRAULICS

REF	PART NO.	DESCRIPTION	REQ'D
1	031-6272	VALVE, logic	1
2	031-3285	VALVE, body	1
3	031-5601	CONNECTOR, quick	2
4	036-1474-004	CLAMP ASSEMBLY 1/2"	6
5	036-1474-008	CLAMP ASSEMBLY 1"	13
6	054-2988-008	ELBOW	1
7	054-3007-010	CONNECTOR, 1" straight	2
8	054-3185-008	ELBOW, 1/2" male	1
9	054-3185-010	FITTING, tube - 90°	1
10	054-3237-002	ELBOW, reducer	1
11	054-3237-005	ELBOW, reducer	1
12	054-3237-011	ELBOW, reducer	1
13	054-3237-013	ELBOW, reducer	1
14	054-3340-003	ELBOW, reducer	1
15	054-3340-006	ELBOW	1
16	054-3341-006	ADAPTER	1
17	054-3341-008	ADAPTER	1
18	054-3344-007	TEE	1
19	054-3533-006	ELBOW, bulkhead	2
20	054-3533-010	ELBOW, bulkhead	3
21	054-3533-006	UNION, bulkhead	3
22	054-3535-007	UNION, bulkhead	1
23	054-3535-010	UNION, bulkhead	3
24	054-3667-003	ELBOW, adapter	1
25	054-7324	ELBOW, w/port	1
26	054-7478	ELBOW, 90° reducing	1
27	054-8800	FITTING, test	1
28	057-2428-037	HOSE, hydraulic, ejector cylinder	1
29	057-2429-037	HOSE, hydraulic, ejector cylinder	1
30	207-2938-003	CHANNEL	2
31	207-2938-014	CHANNEL	3
32	311-0673	BRACKET, bulkhead	1
33	311-1263	BRACKET, bulkhead	1
34	311-2396	BRACKET, bulkhead	1
35	311-2422	BRACKET, bulkhead	1
36	354-1372	TUBE, hydraulic, body valve	1
37	354-1374	TUBE, hydraulic, body valve	1
38	354-1376	TUBE, hydraulic, body valve	1
39	354-1440	TUBE, hydraulic, body valve	1
40	354-1442	TUBE, hydraulic, front head	1
41	354-1443	TUBE, front head	1

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BODY HYDRAULICS



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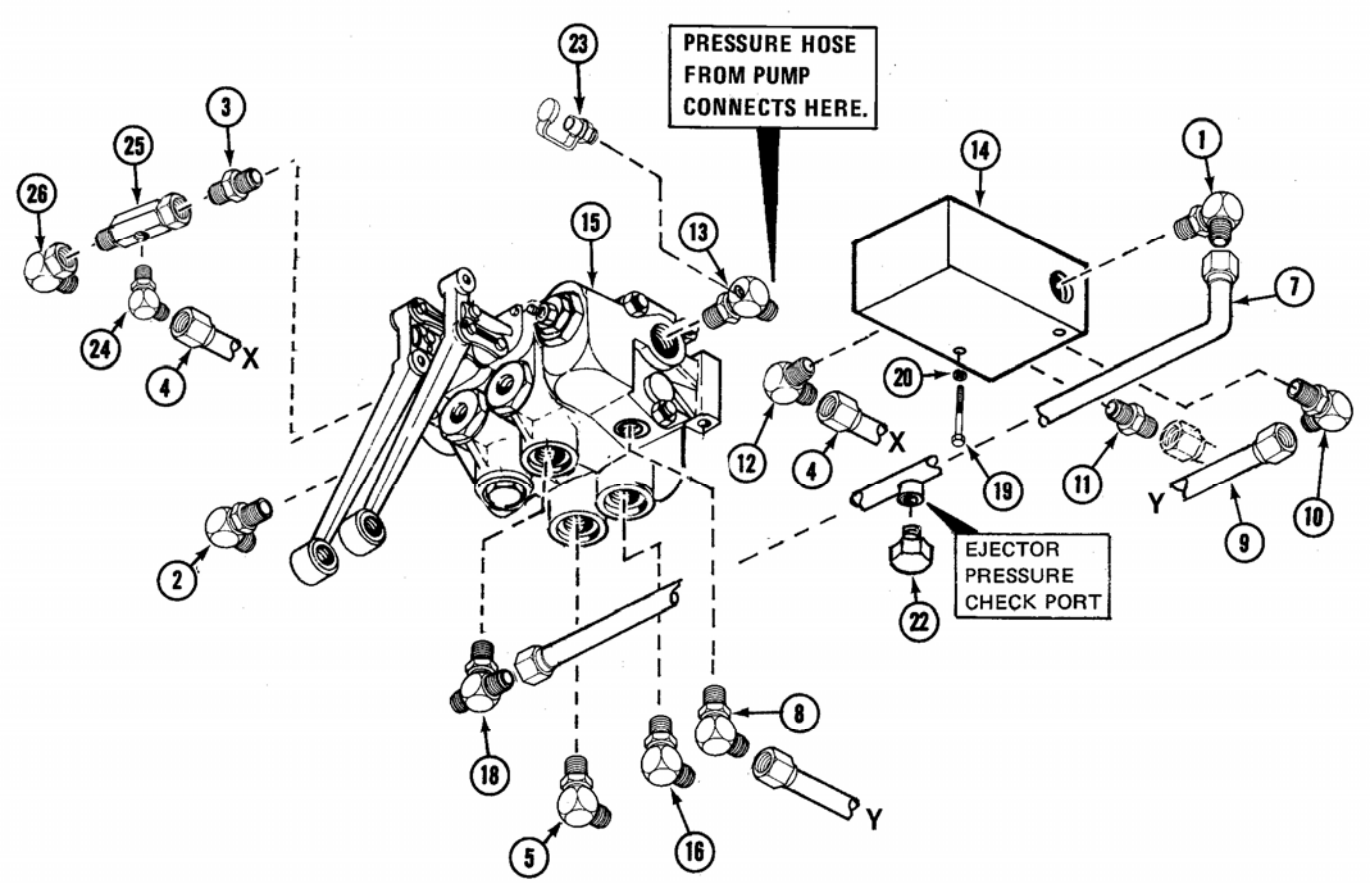
FORMULA 5000

BODY HYDRAULICS

REF	PART NO.	DESCRIPTION	REQ'D
42	354-2086	TUBE, hydraulic – 1" roof (18 yd. units)	1
	354-1880	TUBE, hydraulic – 1" roof (20 yd. units)	1
	354-2000	TUBE, hydraulic – 1" roof (25 yd. units)	1
	354-2089	TUBE, hydraulic – 1" roof (27 yd. units)	1
	354-2092	TUBE, hydraulic – 1" roof (32 yd. units)	1
43	354-2087	TUBE, hydraulic – 1/2" roof (18 yd. units)	1
	354-1881	TUBE, hydraulic – 1/2" roof (20 yd. units)	2
	354-1201	TUBE, hydraulic – 1/2" roof (25 yd. units)	2
	354-2090	TUBE, hydraulic – 1/2" roof (27 yd. units)	2
	354-2093	TUBE, hydraulic – 1" roof (32 yd. units)	1
44	354-1882	TUBE, hydraulic – front head	1
45	354-1883	TUBE, hydraulic – front head	1
46	354-1884	TUBE, hydraulic – front head	1
47	354-1885	TUBE, hydraulic – front head	1
48	354-1886	TUBE, hydraulic – 1" roof (20 yd. units)	1
	354-2002	TUBE, hydraulic – 1" roof (25 yd. units)	1
	354-2091	TUBE, hydraulic – 1" roof (27 yd. units)	1
	354-2094	TUBE, hydraulic – 1" roof (32 yd. units)	1
49	354-1897	TUBE, hydraulic – ejector	1
50	354-2100	TUBE, hydraulic	1
52	FS100836	CAPSCREW, hex 5/16"-24 x 2-3/4	5
53	FS240800	NUT, lock 5/16"-24	5

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UNDERBODY VALVE and EJECTOR VALVE FITTINGS



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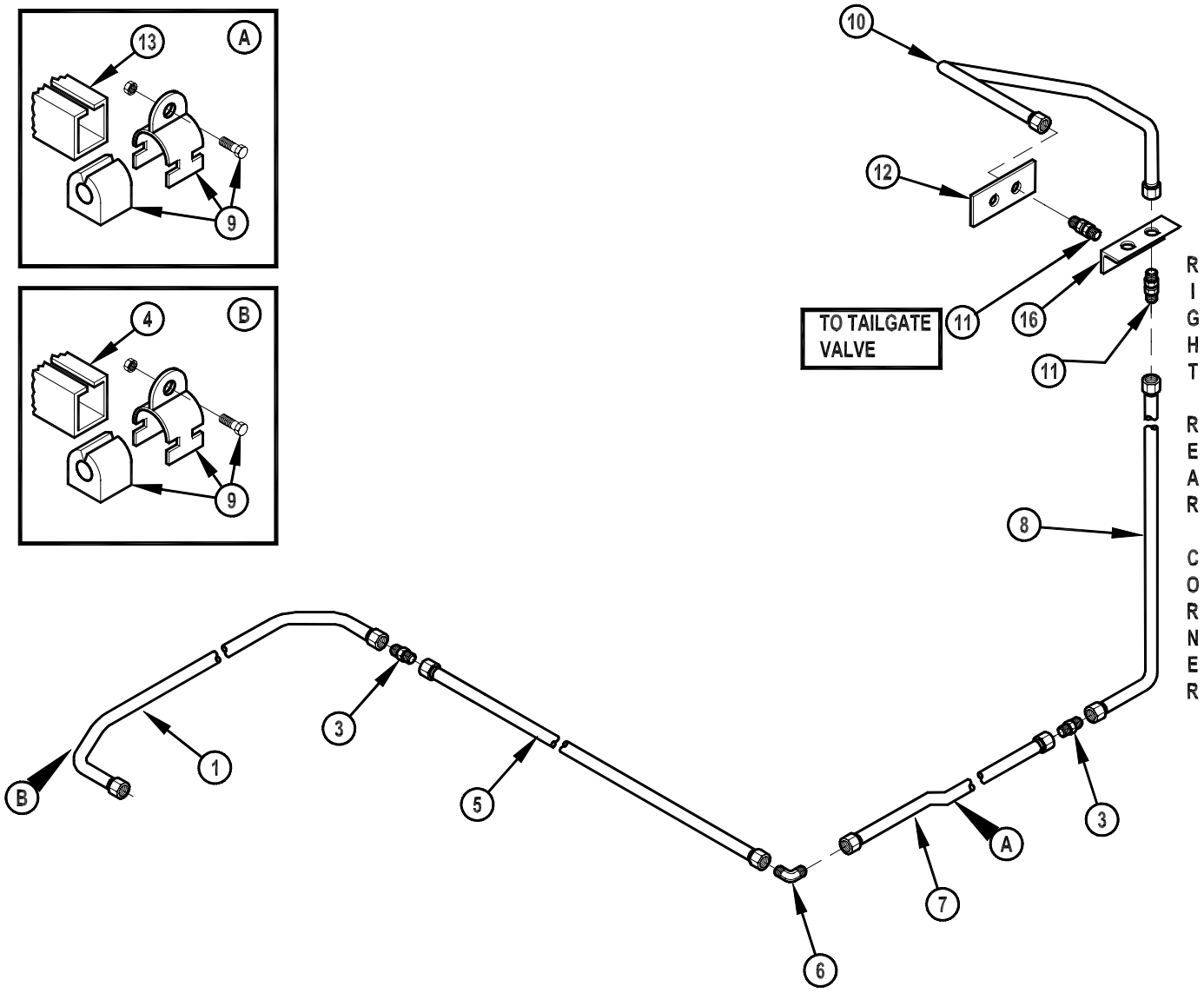
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UNDERBODY VALVE and EJECTOR VALVE FITTINGS

REF	PART NO.	DESCRIPTION	REQ'D
1	054-3237-005	ELBOW, 90° reducing	1
2	054-3237-002	ELBOW, 90° reducing	1
3	054-3341-008	CONNECTOR	1
4	354-1372	TUBE, hydraulic	1
5	054-3237-013	ELBOW, 90° reducing	1
6	054-3609-17	BUSHING, reducing	1
7	354-1374	TUBE, hydraulic	1
8	054-3340-003	ELBOW, 90° reducing	1
9	354-1376	TUBE, hydraulic	1
10	054-3237-011	ELBOW, 90° reducing	1
11	054-3341-006	CONNECTOR	1
12	054-3340-006	ELBOW, 90°	1
13	054-7324	ELBOW, 90°	1
14	REF.	VALVE, ejector unload (see section 5)	1
15	REF.	VALVE, underbody (see section 5)	1
16	054-7478	ELBOW, 90° (tall)	1
18	054-3344-007	TEE	1
19	FS100836	CAPSCREW – 5/16" – 24NF x 2-3/4"	2
20	FS550800	WASHER, lock – 5/16"	2
21	FS240800	NUT, lock – 5/16" – 24NF	2
23	031-5601	DISCONNECT, quick	1
24	054-3667-003	ELBOW, 90°	1
25	054-8800	TEE	1
26	054-2988-008	ELBOW, 90°	1

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BODY HYDRAULICS
TAILGATE VALVE RETURN from TAILGATE



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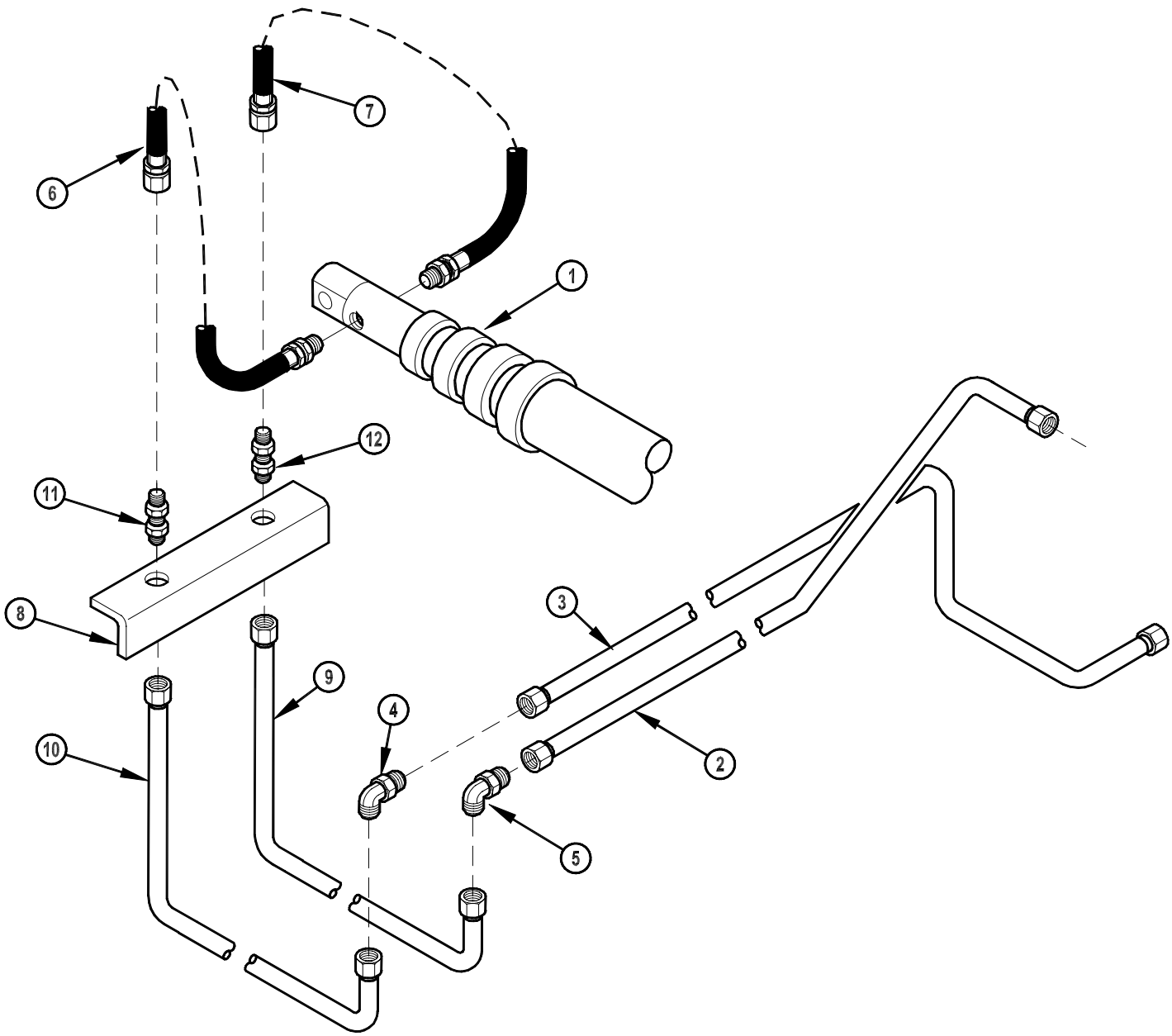
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BODY HYDRAULICS
TAILGATE VALVE RETURN from TAILGATE

REF	PART NO.	DESCRIPTION	REQ'D
1	354-1360	TUBE, hydraulic	1
3	054-3007-010	CONNECTOR, straight – 1"	2
4	207-2938-014	CHANNEL, clamp	A/R
5	354-1359-018	TUBE, hydraulic – 18 yd body	1
	354-1359-020	TUBE, hydraulic – 20 yd body	1
	354-1359-025	TUBE, hydraulic – 25 yd body	1
	354-1359-027	TUBE, hydraulic – 27 yd body	1
	354-1359-032	TUBE, hydraulic – 32 yd body	1
6	054-3185-016	ELBOW, 90° - 1"	1
7	354-0835	TUBE, hydraulic	1
8	354-1357	TUBE, hydraulic	1
9	036-1474-010	CLAMP, tube – 1"	A/R
10	354-1356	TUBE, hydraulic (used on earlier units)	1
	354-1710	TUBE, hydraulic (used on latest units)	1
11	054-3535-010	FITTING, bulkhead – 1"	2
12	311-0683	BRACKET, bulkhead	1
13	207-2938-008	CHANNEL, clamp	A/R
16	311-1151	BRACKET	1

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BODY HYDRAULICS – EJECTOR CYLINDER



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BODY HYDRAULICS – EJECTOR CYLINDER

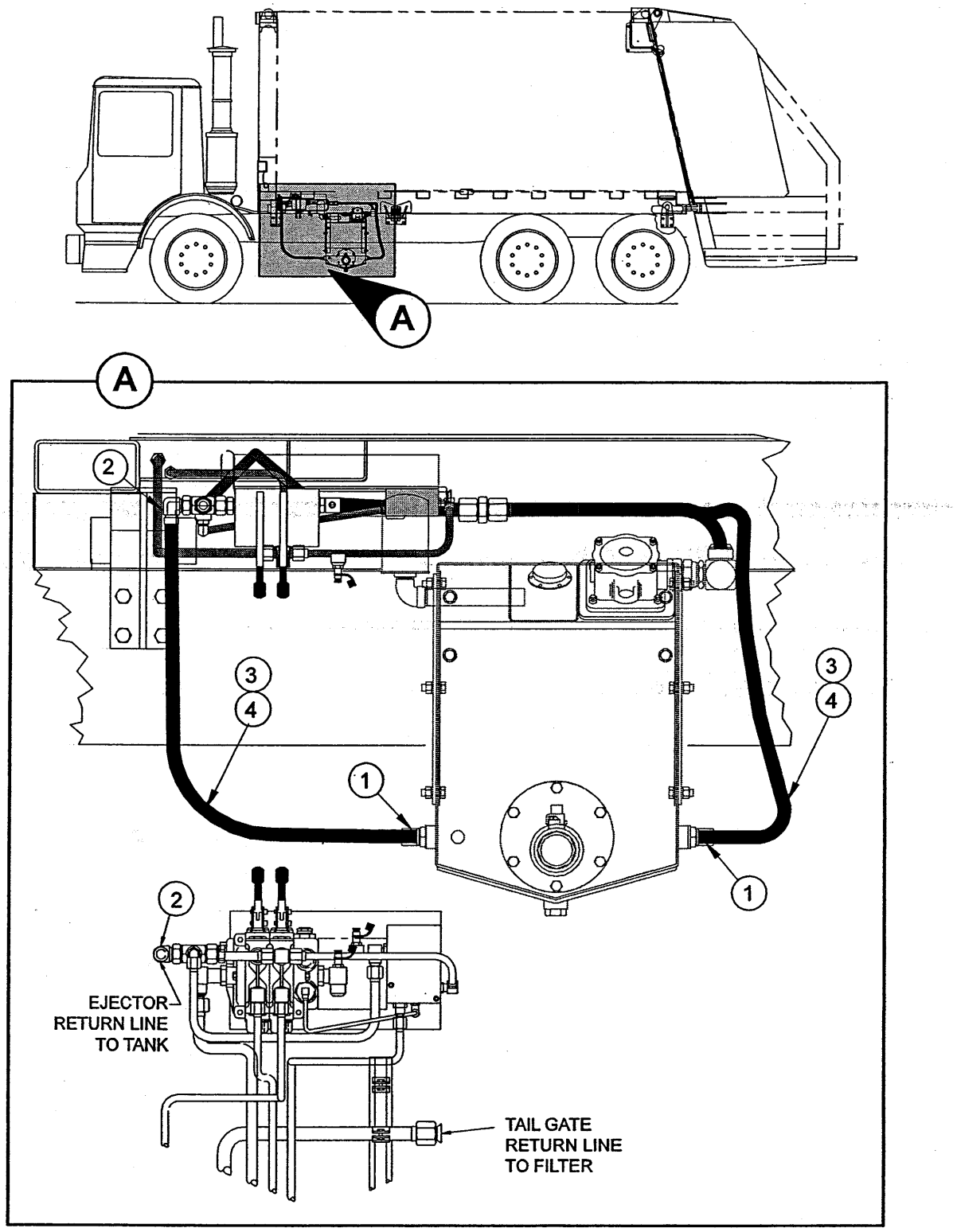
REF	PART NO.	DESCRIPTION	REQ'D
1	REF.	CYLINDER, ejector (see section 5)	1
2	354-1374	TUBE, hydraulic – 5/8"	1
3	354-1440	TUBE, hydraulic – 1/2"	1
4	054-3185-008	ELBOW, 90° - 1/2"	1
5	054-3185-010	ELBOW, 90° - 5/8"	1
6	057-2428-037	HOSE, hydraulic	1
7	057-2429-037	HOSE, hydraulic	1
8	311-1263	BRACKET, bulkhead	1
9	354-1442	TUBE, hydraulic – 5/8"	1
10	354-1443	TUBE, hydraulic – 1/2"	1
11	054-3533-006	UNION, bulkhead – 1/2"	1
12	054-3533-007	UNION, bulkhead – 5/8"	1

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OIL TANK RETURN LINES



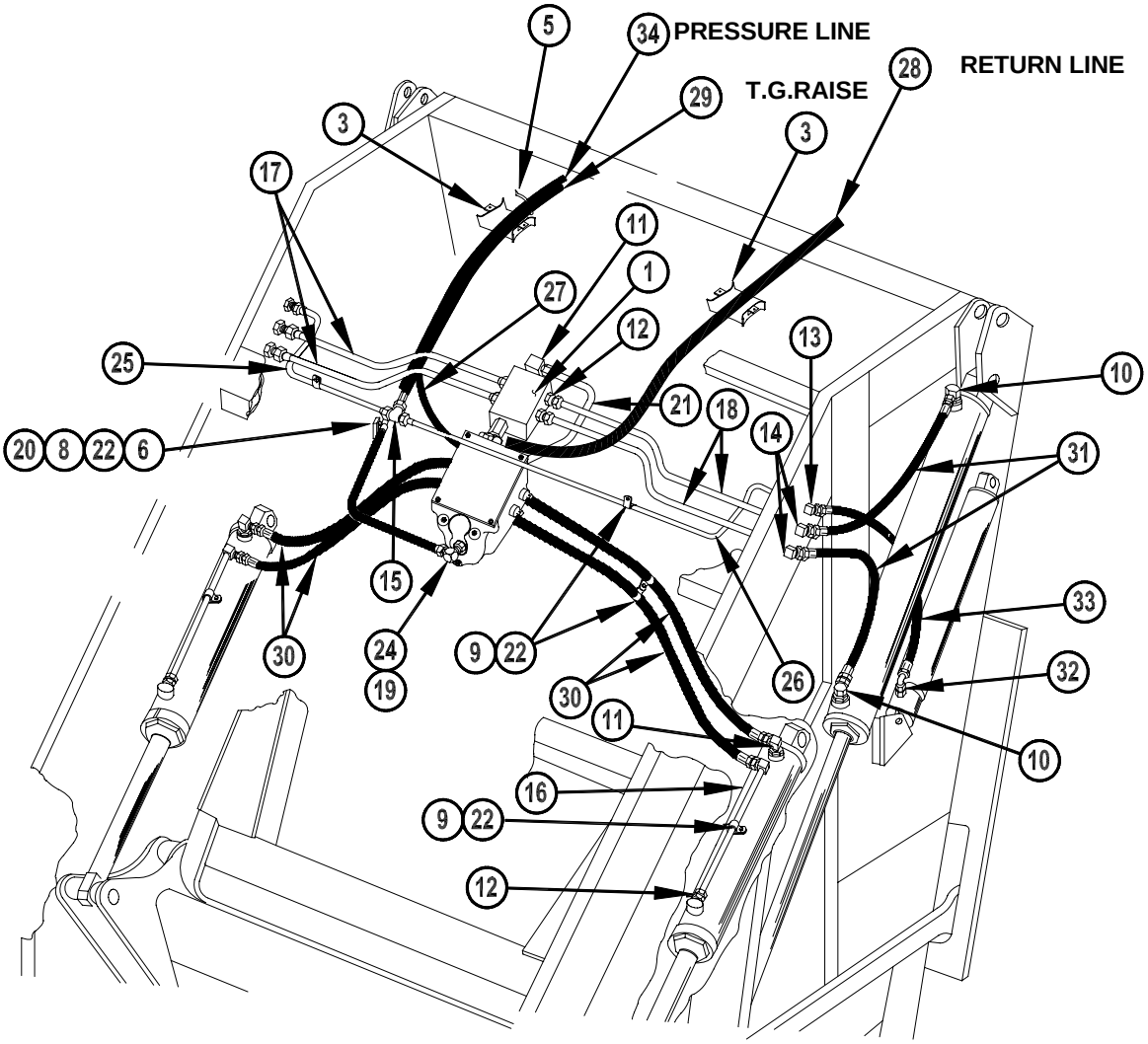
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REF	PART NO.	DESCRIPTION	REQ'D
1	054-3340-010	ELBOW, 90°	2
2	054-6547-026	FITTING, reducer	1
3	057-2194-140	HOSE, return – 1"	2
4	036-1499	CLAMP, fiber guard	3

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TAILGATE HYDRAULICS



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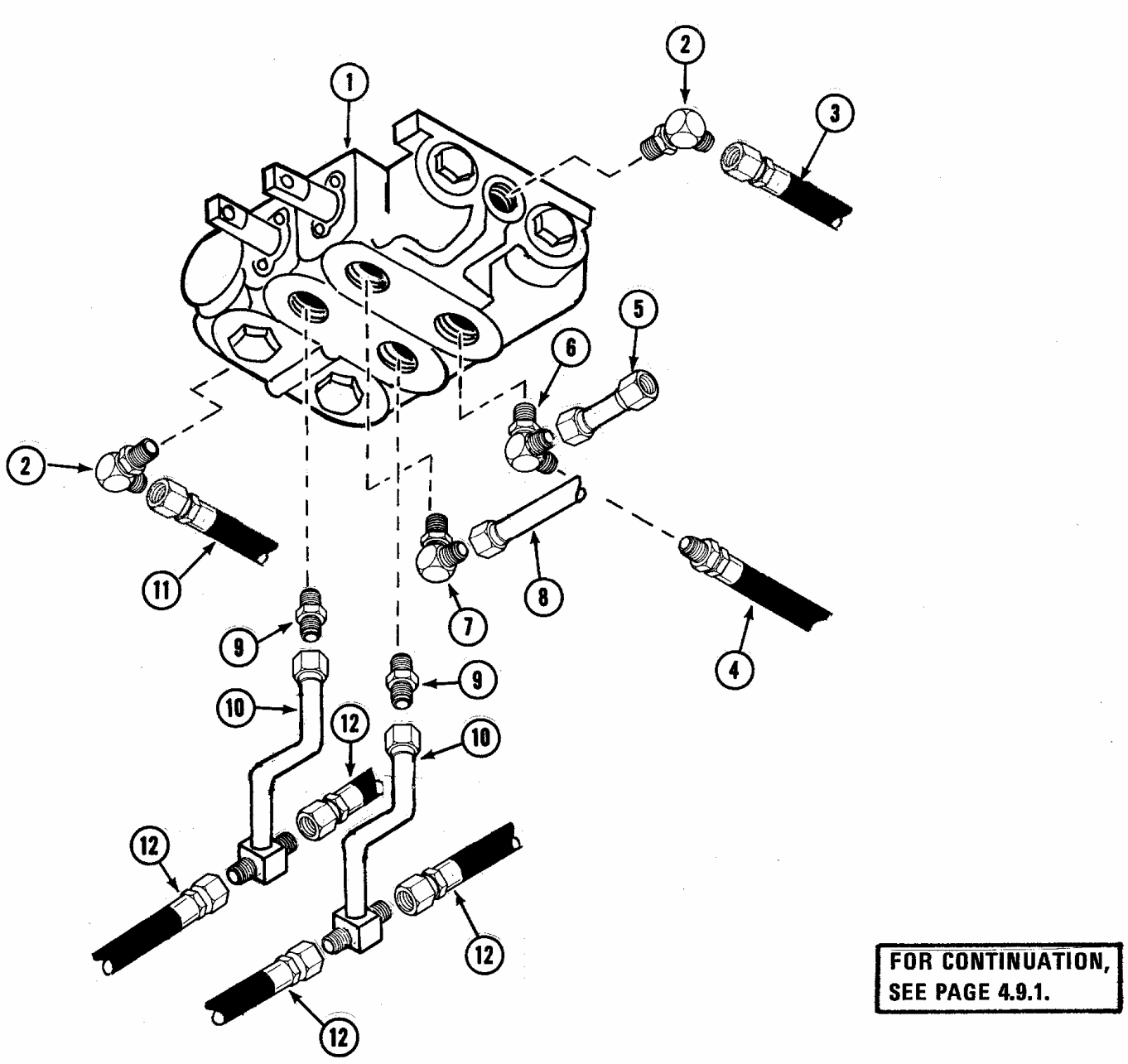
FORMULA 5000

TAILGATE HYDRAULICS

REF	PART NO.	DESCRIPTION	REQ'D
1	031-6285	VALVE, regenerative (see section 5)	1
2	REF.	VALVE, tailgate control (see section 5)	1
3	177-2114	BRACKET, clamp	2
	FS070915	CAPSCREW – 3/8" – 16NC x 3/4"	4
	FS230900	NUT, lock – 3/8" – 16NC	4
4	036-1122-008	CLAMP, tube – 1/2"	2
5	036-1290	STRAP, tie	8
6	036-1295-001	CLAMP, tube	8
8	FS240900	NUT, lock – 3/8" – 24NF	3
9	FS540900	WASHER, lock – 3/8"	10
10	054-3237-003	ELBOW, 90° reducing	4
11	054-3340-008	ELBOW, 90°	4
12	054-3341-008	CONNECTOR	7
13	054-3533-006	ELBOW, 90° bulkhead	2
14	054-3533-008	ELBOW, 90° bulkhead	4
15	054-3623-006	TEE	1
16	054-4571-021	TUBE, hydraulic	2
17	054-6462	TUBE, hydraulic	2
18	054-6463	TUBE, hydraulic	2
19	FS231100	NUT, lock – 1/2" – 13NC	4
20	FS071126	CAPSCREW – 1/2" – 13NC x 1-3/4"	4
21	054-7342	TUBE, hydraulic	1
22	FS100915	CAPSCREW – 3/8" – 24NF x 3/4"	8
23	054-7506-005	TEE	1
24	FS071126	CAPSCREW – 1/2" – 13NC x 1-3/4"	4
25	054-7363	TUBE, hydraulic	1
26	054-7364	TUBE, hydraulic	1
27	QC3-FFFF-068	HOSE, hydraulic (ejector unload)	1
28	QA6-FKFK-075	HOSE, hydraulic (return)	1
29	QC3-EFFF-055	HOSE, hydraulic (tailgate raise)	1
30	QX5-FHFH-048	HOSE, hydraulic	4
31	QV5-FHFH-030	HOSE, hydraulic	4
32	054-7434	ELOBW, 90° (special)	2
33	QC3-FFFF-049	HOSE, hydraulic (tailgate raise cyl.)	2
34	QV6-FHFK-078	HOSE, hydraulic (body to tailgate)	1

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TAILGATE CONTROL VALVE FITTINGS



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TAILGATE CONTROL VALVE FITTINGS

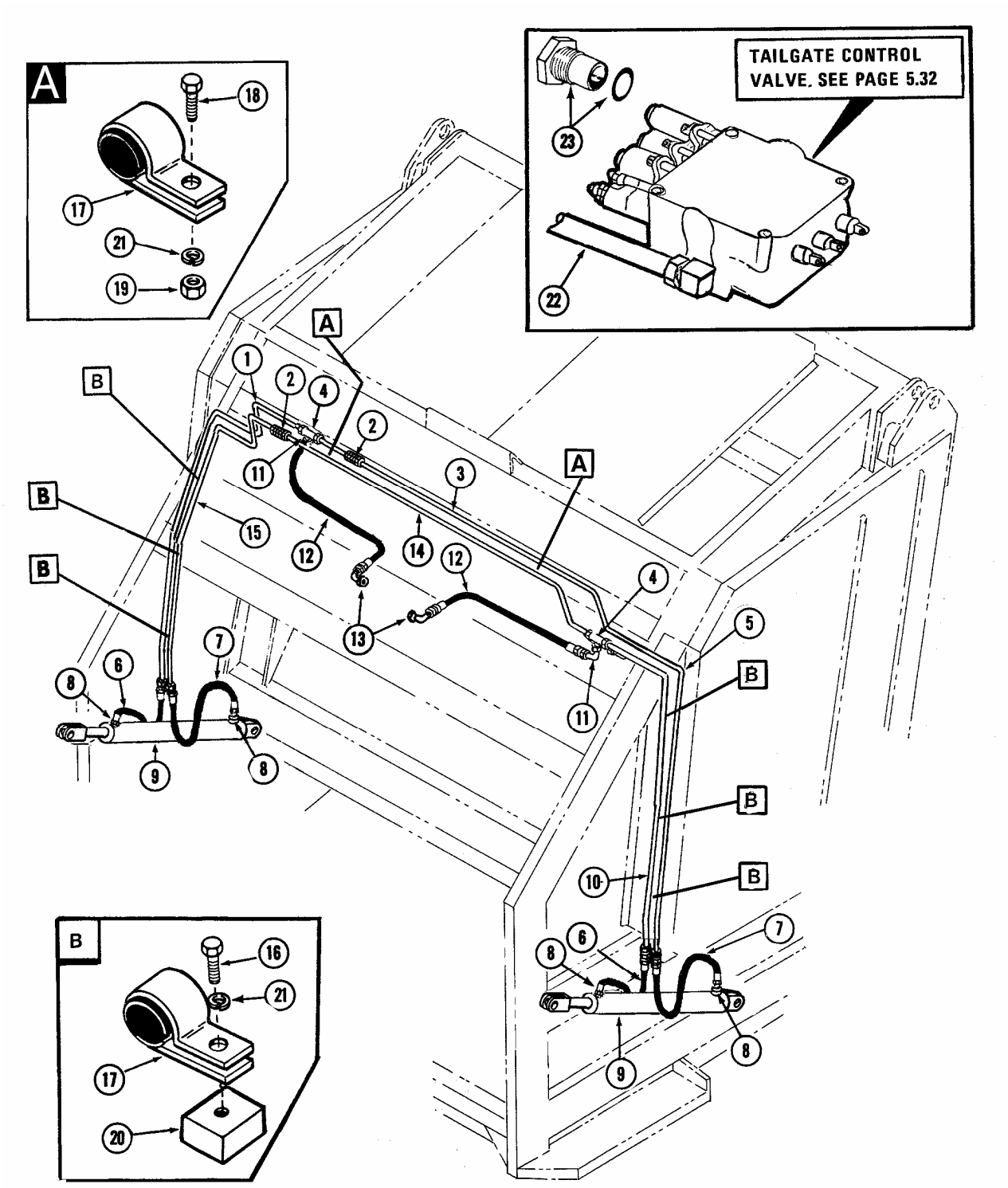
REF	PART NO.	DESCRIPTION	REQ'D
1	REF.	VALVE, tailgate control (see section 5)	1
2	054-3340-010	ELBOW, 90°	1
3	QA6-FKFK-075	HOSE, hydraulic (return)	1
4	QC3-FFFF-068	HOSE, hydraulic (ejector unload)	1
5	054-7343	TUBE, hydraulic	1
6	054-7341	ELBOW, 90° - with spud	1
7	054-3340-008	ELBOW, 90°	1
8	054-7342	TUBE, hydraulic	1
9	054-3341-008	CONNECTOR	2
10	054-7340	TUBE, hydraulic	2
11	QV6-FHFK-78	HOSE, hydraulic (pressure)	1
12	QX5-FHFH-48	HOSE, hydraulic (special)	4
13	054-3629-008	ELBOW, 45°	2
14	054-3623-008	TEE	2

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ROLL BAR MECHANISM HYDRAULICS



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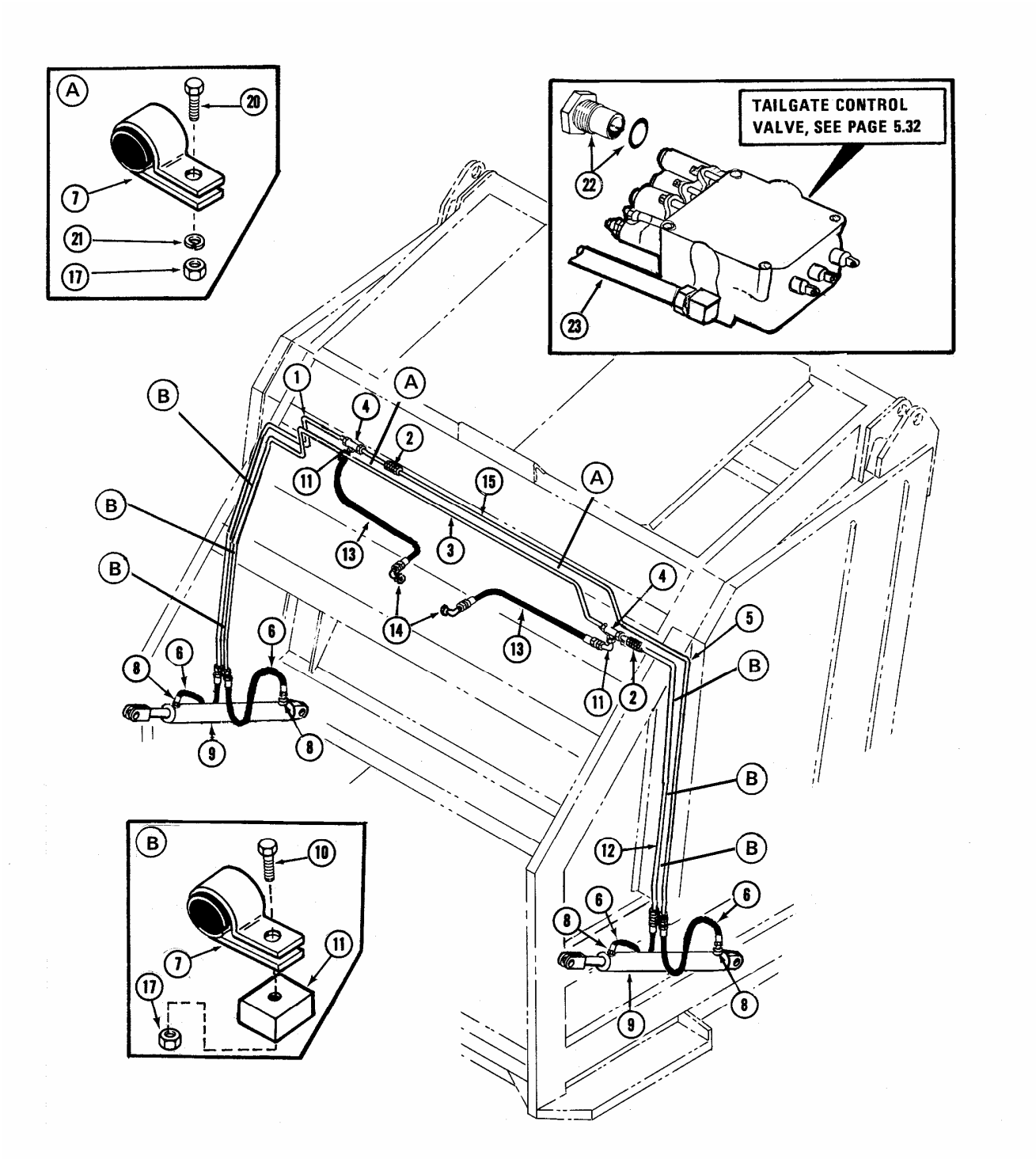
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ROLL BAR MECHANISM HYDRAULICS

REF	PART NO.	DESCRIPTION	REQ'D
1	054-7403	TUBE, hydraulic	1
2	054-3007-005	CONNECTOR, straight	2
3	207-8976	TUBE, hydraulic	1
4	054-3139-005	TEE	2
5	054-7138	TUBE, hydraulic	1
6	057-1895-018	HOSE, hydraulic	2
7	057-1895-020	HOSE, hydraulic	2
8	054-3341-005	CONNECTOR, straight	4
9	REF.	CYLINDER, roll bar (see section 5)	1
10	054-7137	TUBE, hydraulic	1
11	054-2988-005	ELBOW, 90°	2
12	057-2145-031	HOSE, hydraulic	2
13	054-3237-017	ELBOW, 90° reducing	2
14	207-8975	TUBE, hydraulic	1
15	054-7402	TUBE, hydraulic	1
16	FS100813	CAPSCREW – 5/16" – 24NF x 5/8"	6
17	036-1122-006	CLAMP, tube	18
18	FS070713	CAPSCREW – 1/4" – 20NC x 5/8"	2
19	FS230700	NUT, lock – 1/4" – 20NC	2
20	077-6846	SUPPORT	6
21	FS540800	WASHER, lock – 5/16"	6
22	054-7344-003	TUBE, hydraulic (pressure)	1
23	025-0472	PLUG	1

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ARM MECHANISM HYDRAULICS



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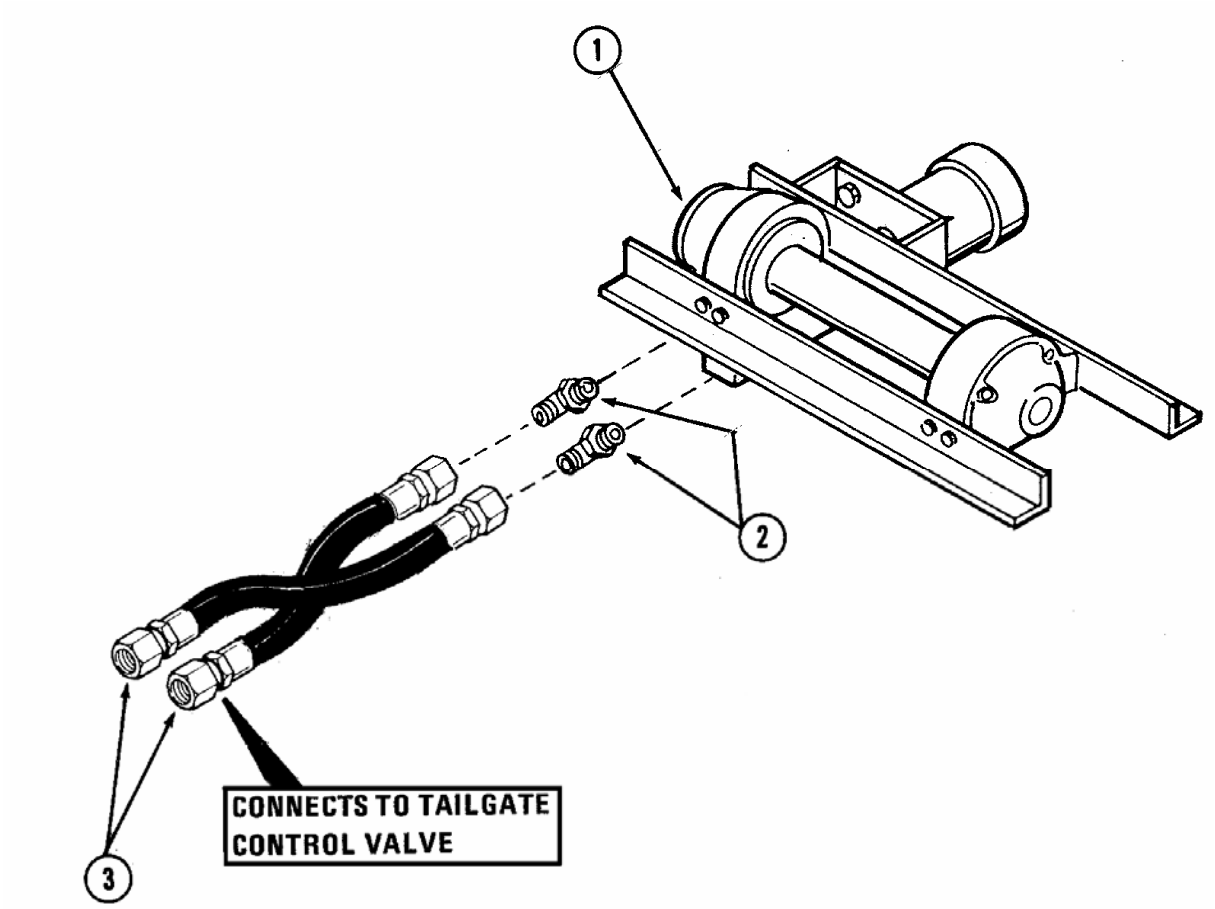
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ARM MECHANISM HYDRAULICS

REF	PART NO.	DESCRIPTION	REQ'D
1	054-7403	TUBE, hydraulic	1
2	054-3007-005	CONNECTOR, straight	2
3	207-8976	TUBE, hydraulic	1
4	054-3139-005	TEE	2
5	054-7138	TUBE, hydraulic	1
6	057-1895-023	HOSE, hydraulic	2
7	206-8119	CLAMP, tube	10
8	054-3526-009	CONNECTOR, straight	4
9	REF.	CYLINDER, arm (see section 5)	1
10	FS070715	CAPSCREW – 1/4" – 20NC x 5/8"	6
11	077-8302	BRACKET	2
12	054-7137	TUBE, hydraulic	1
13	057-2145-031	HOSE, hydraulic	2
14	054-3237-017	ELBOW, 90° reducing	2
15	207-8975	TUBE, hydraulic	1
16	054-7402	TUBE, hydraulic	1
17	FS230700	NUT, lock – 1/4" – 20NC	2
18	077-6846	SUPPORT	6
19	036-1122-006	CLAMP, tube	14
20	FS100813	CAPSCREW – 5/16" – 24NF x 5/8"	6
21	FS540800	WASHER, lock – 5/16"	6
22	025-0472	PLUG	1
23	054-7344-003	TUBE, hydraulic (pressure)	1

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WINCH CYLINDER HYDRAULICS



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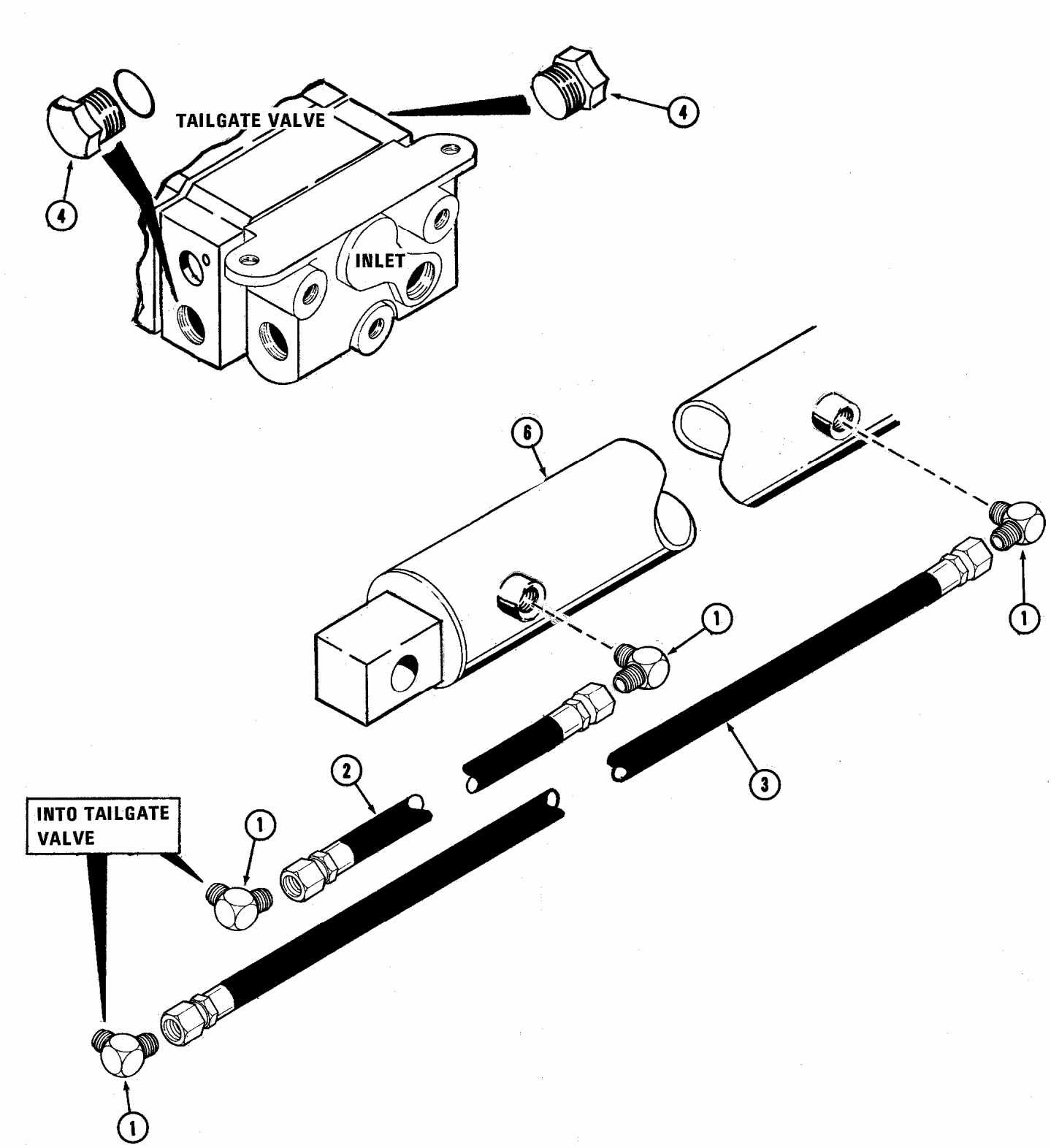
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WINCH CYLINDER HYDRAULICS

REF	PART NO.	DESCRIPTION	REQ'D
1	REF.	WINCH ASSEMBLY (see section 5)	1
2	054-3007-007	CONNECTOR	2
3	057-2144-037	HOSE, hydraulic	2
4	054-3237-017	ELBOW, 90° reducing	2

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REEVING CYLINDER HYDRAULICS



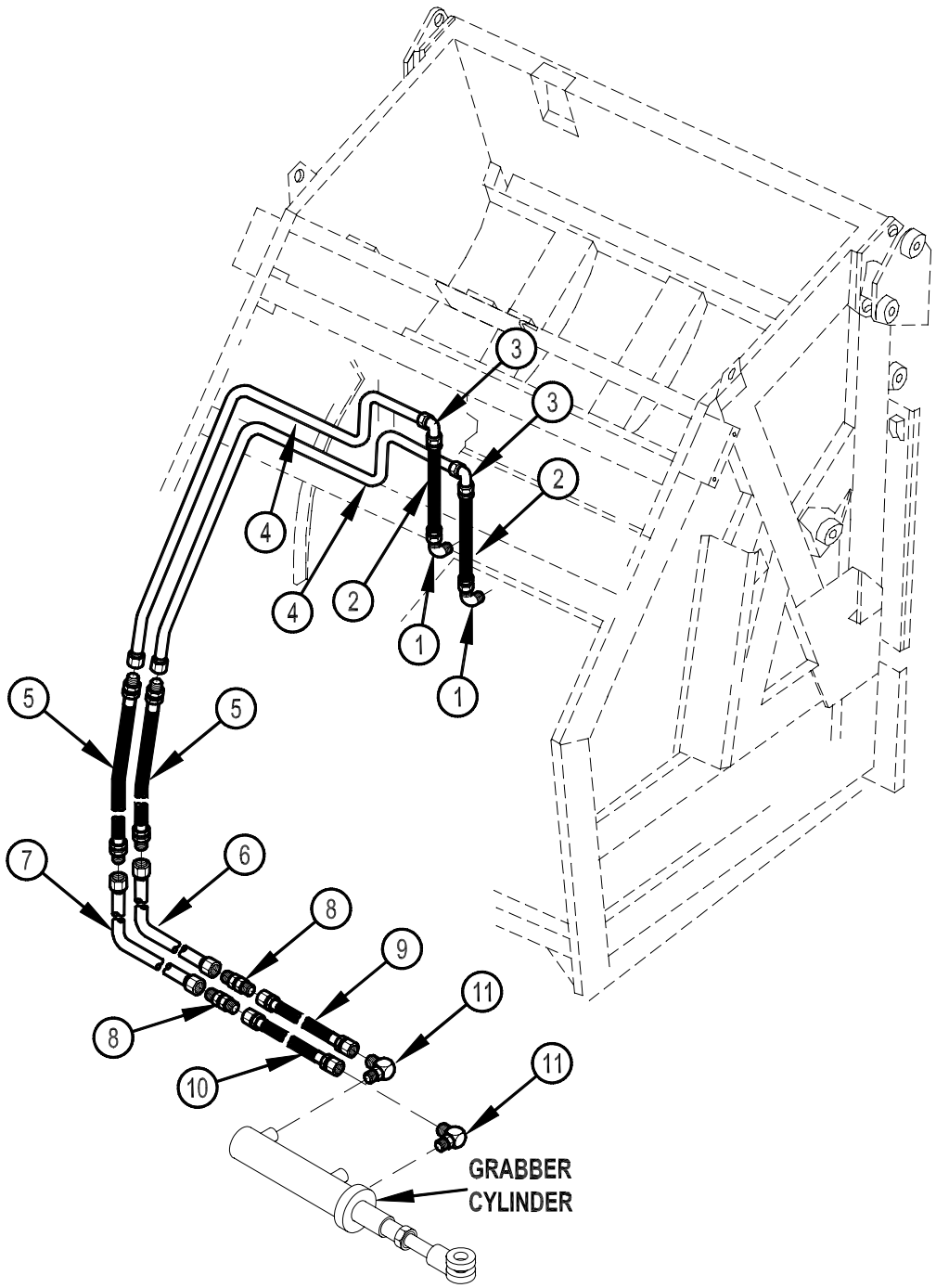
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REEVING CYLINDER HYDRAULICS

REF	PART NO.	DESCRIPTION	REQ'D
1	054-3237-017	ELBOW, 90° reducing	4
2	QC3-FFFF-079	HOSE, hydraulic	1
3	QC3-FFFF-139	HOSE, hydraulic	1
4	025-0472	PLUG	2
5	206-7561	CLAMP	5
6	REF.	CYLINDER, reeving (see section 5)	1

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ROLL BAR GRABBER HYDRAULIC



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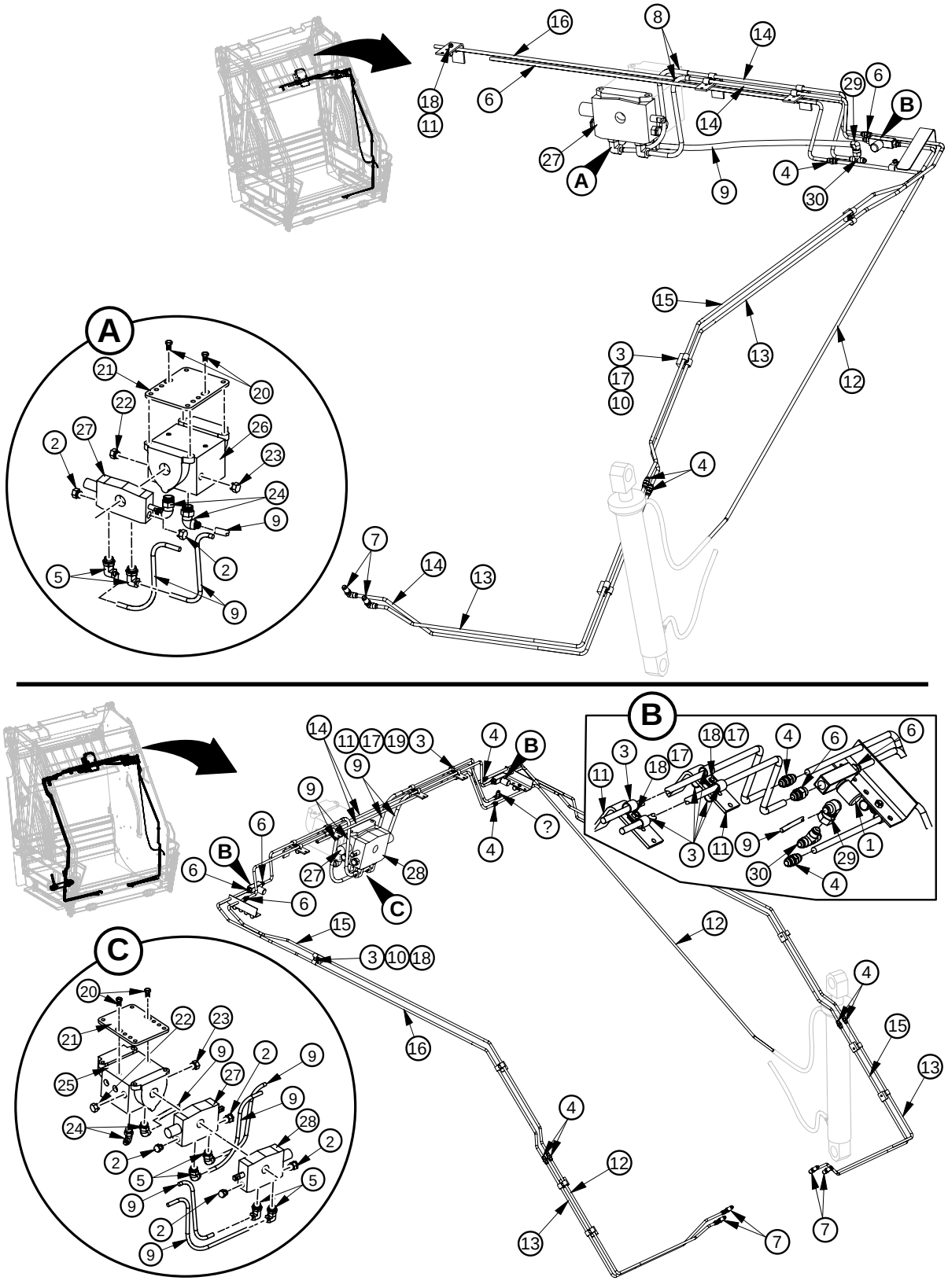
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ROLL BAR GRABBER HYDRAULIC

REF	PART NO.	DESCRIPTION	REQ'D
1	054-3237-017	ELBOW, 90° reducing	2
2	057-2145-031	HOSE, hydraulic	2
3	054-3185-006	ELBOW, 90°	2
4	054-9467	TUBE, hydraulic	2
5	QC2-EEEE-021	HOSE, hydraulic	2
6	054-9455	TUBE, hydraulic	1
7	054-9456	TUBE, hydraulic	1
8	054-3533-005	CONNECTOR, bulkhead	2
9	QC2-FEFE-019	HOSE, hydraulic	1
10	QC2-FEFE-021	HOSE, hydraulic	1
11	054-3340-005	ELBOW, 90°	2

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CART DUMPER HYDRAULIC KIT
1ST DUMPER 372-1522-001
2ND DUMPER 372-1522-002



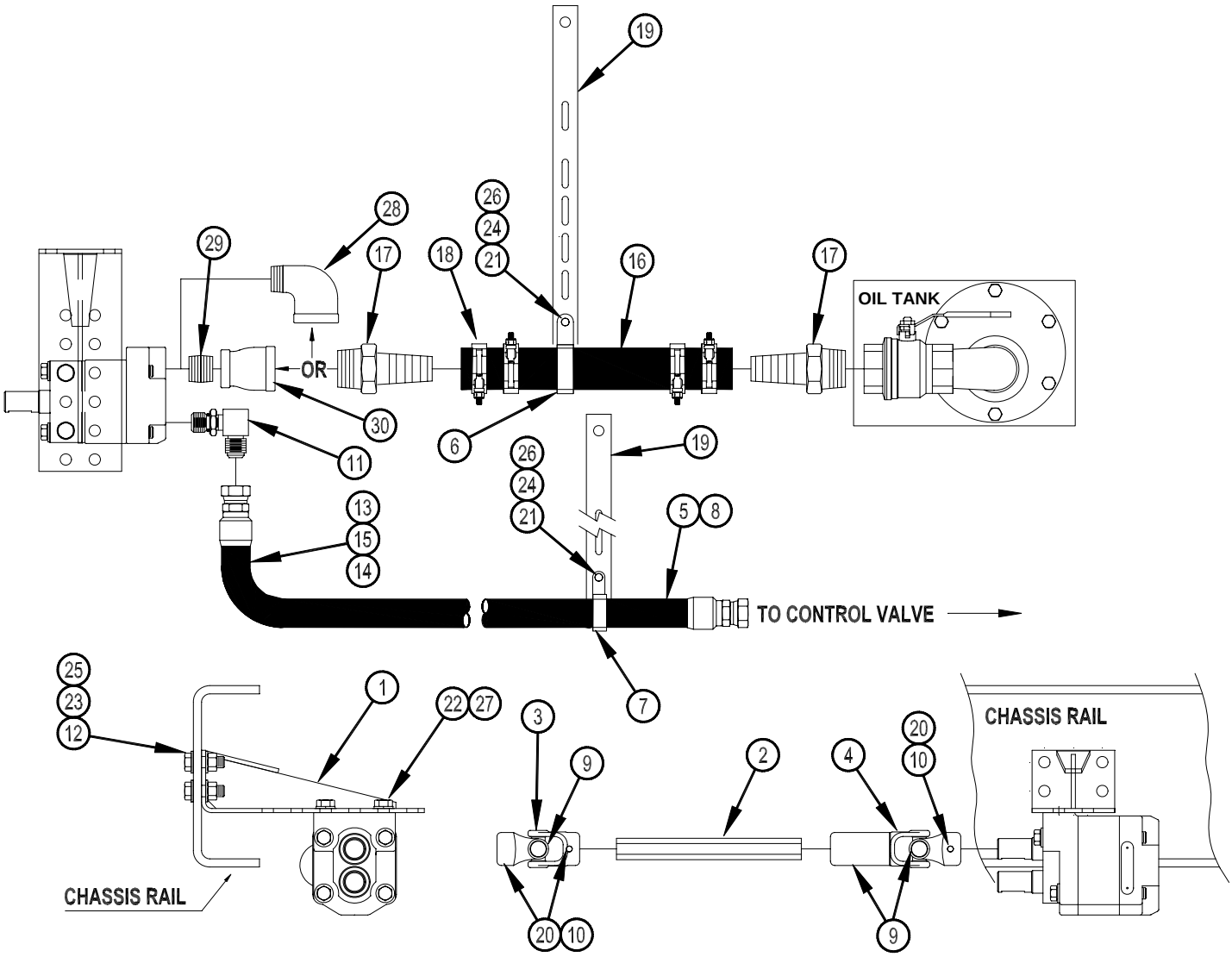
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CART DUMPER HYDRAULIC KIT
1ST DUMPER 372-1522-001
2ND DUMPER 372-1522-002

REF	PART NO.	DESCRIPTION	REQ'D
1	031-6214	VALVE, needle 3/8" port	1
2	031-6392	RELIEF, (2000 PSI)	2
3	036-1122-006	CLAMP, tube 3/8"	A/R
4	054-3007-005	UNION	3
5	054-3237-009	ELBOW, 90° reducing	2
6	054-3341-005	ADAPTER, straight	2
7	054-3533-005	UNION	2
8	057-2145-003	HOSE, hydraulic	1
9	057-2145-031	HOSE, hydraulic	1
10	077-6846	TUBE, support	4
11	207-5203	BRACKET, clamp	1
12	354-2215	TUBE, hydraulic (372-1522-002)	1
	354-2154	TUBE, hydraulic (372-1522-001)	1
13	354-2216	TUBE, hydraulic (372-1522-002)	1
	354-2155	TUBE, hydraulic (372-1522-001)	1
14	354-2444	TUBE, hydraulic (372-1522-002)	2
	354-2156	TUBE, hydraulic (372-1522-001)	1
15	354-2449	TUBE, hydraulic (372-1522-002)	1
	354-2158	TUBE, hydraulic (372-1522-001)	1
16	354-2450	TUBE, hydraulic (372-1522-002)	1
	354-2444	TUBE, hydraulic (372-1522-001)	2
17	FS070713	CAPSCREW, 1/4" – 20 NC x 5/8" (Only on 372-1522-002)	1
18	FS100813	CAPSCREW, 5/16" – 24 NC x 1.25"	5
19	FS230700	LOCKNUT, 1/4" – 20 NC (372-1522-002)	2
	FS230700	LOCKNUT, 1/4" – 20 NC (372-1522-001)	1
20	071120	CAPSCREW	2
21	311-0476	BRACKET, TG valve	1
22	031-3242	VALVE, relief (1400 PSI)	1
23	025-0472	PLUG, relief port	1
24	054-3237-017	ELBOW, 90° reducing	2
25	031-6269	CONTROL VALVE, secondary	1
26	031-6269-003	CONTROL VALVE, secondary	1
27	031-6267	VALVE SECTION	1
28	031-6278	VALVE SECTION, (left hand)	1
29	054-2988-005	ELBOW, 90° reducing	1
30	054-3139-005	CONNECTOR, stright	1

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PTO – PUMP DRIVE KIT
272-1870



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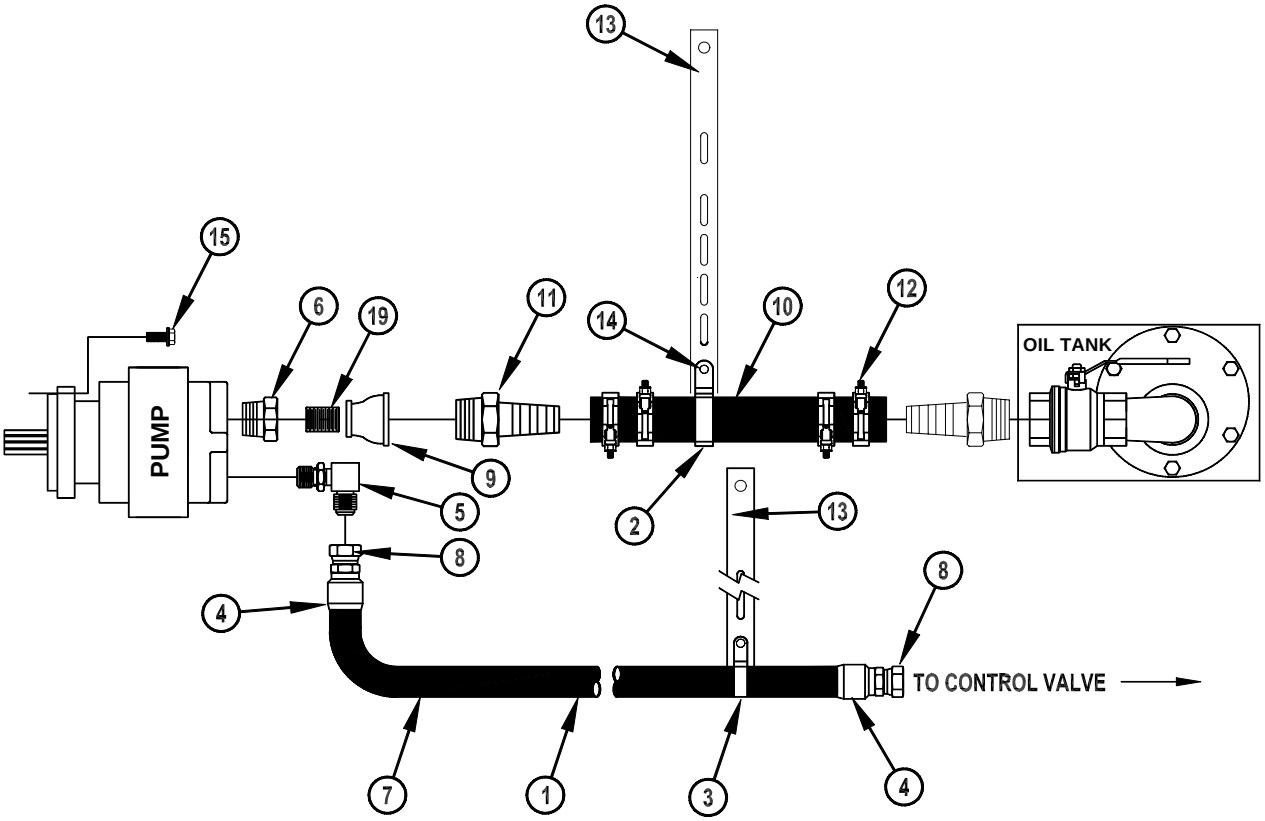
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PTO – PUMP DRIVE KIT
272-1870

REF	PART NO.	DESCRIPTION	REQ'D
1	011-4049	BRACKET, pump	1
2	008-8111	SHAFT, drive	1
3	030-0586	JOINT, universal	1
4	030-0587	JOINT, universal	1
5	035-2727	GUARD, fiber	7ft
6	036-1295-007	CLAMP – 2-7/16"	1
7	036-1478	CLAMP	2
8	036-1499	CLAMP, bandit	2
9	042-1356	CAP, grease fitting	4
10	047-1088	SETSCREW	3
11	054-3237-002	ELBOW, 90°	1
12	055-1391-007	WASHER, hardened	8
13	057-1719-005	END, pressure hose reuseable (shipper units)	1
14	057-1719-010	FITTING, pressure hose	2
15	057-1719	HOSE, pressure – (bulk)	7ft
16	057-2172	HOSE, suction – 2"	6ft
17	058-8579-006	FITTING, suction hose	2
18	074-4498-032	CLAMP, suction hose	4
19	211-9851	SUPPORT, bracket	2
20	263-0042	WIRE, lock	2
21	FS070920	CAPSCREW – 3/8" – 16NC x 1"	3
22	FS071322	CAPSCREW – 5/8" – 11NC x 1-1/4"	2
23	FS071330	CAPSCREW – 5/8" – 11NC x 2"	4
24	FS230900	NUT, lock – 3/8" – 16NC	3
25	FS231300	NUT, lock – 5/8" – 11NC	4
26	FS520900	WASHER, flat – 3/8"	6
27	FS541300	WASHER, lock – 5/8"	2
28	FS853024	ELBOW, 90° reducing street	1
29	FS882400	NIPPLE, close – 1-1/2"	1
30	FS933024	REDUCER, bell – 2" x 1-1/2"	1

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DIRECT MOUNT PUMP KIT
272-2623



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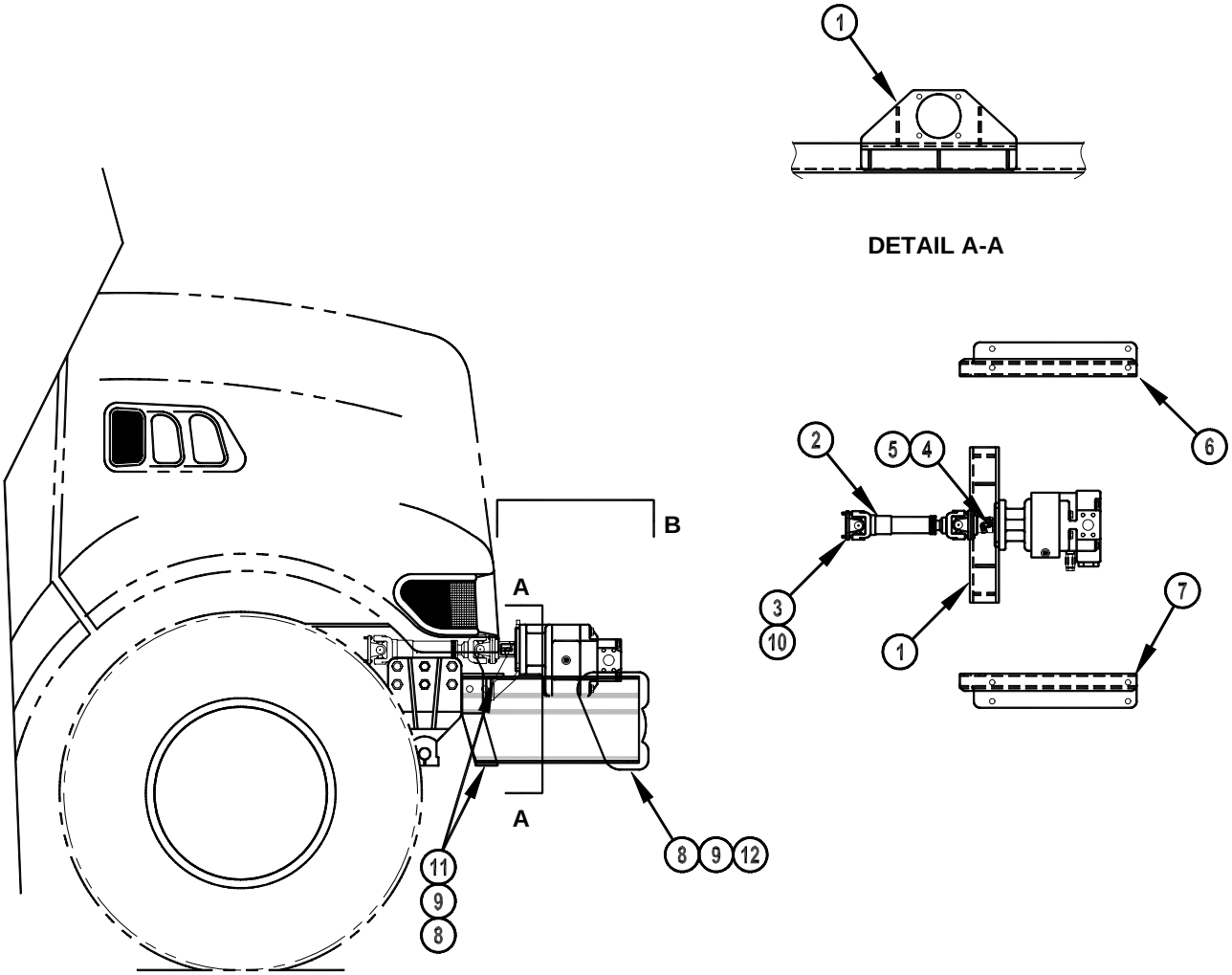
FORMULA 5000

DIRECT MOUNT PUMP KIT
272-2623

REF	PART NO.	DESCRIPTION	REQ'D
1	035-2727	GUARD, fiber	14ft
2	036-1295-007	CLAMP – 2-7/16"	4
3	036-1478	CLAMP	7
4	036-1499	CLAMP, bandit	2
5	054-3237-007	ELBOW, 90° reducing	1
6	054-4194-010	ADAPTER, female	1
7	057-1719-005	HOSE, hydraulic – w/reuseable ends	1
8	057-1719-010	FITTING, hose	2
9	FS933023	REDUCER, bell – 1-1/4"	1
10	057-2172	HOSE, hydraulic – suction 2"	12ft
11	058-8579-006	FITTING, suction hose	2
12	074-4498-032	CLAMP, sluction hose	4
13	211-9851	BRACKET, hose support	10
14	FS070920	CAPSCREW – 3/8" – 16NC x 1"	11
	FS520900	WASHER, flat – 3/8"	22
	FS230900	NUT, lock – 3/8" – 16NC	11
15	FS071122	CAPSCREW – 1/2" – 13NC x 1-1/4"	4
	FS541100	WASHER, lock – 1/2"	4
16	FS882200	NIPPLE, close – 1-1/4"	1

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FRONT MOUNT PUMP INSTALLATION for STERLING ACTERRA CHASSIS 372-0355



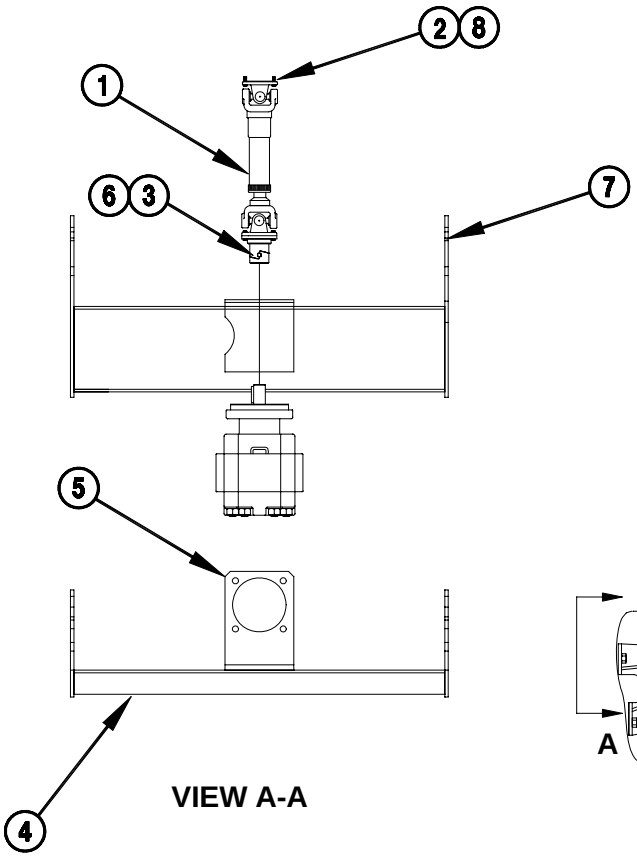
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FRONT MOUNT PUMP INSTALLATION for STERLING ACTERRA CHASSIS 372-0355

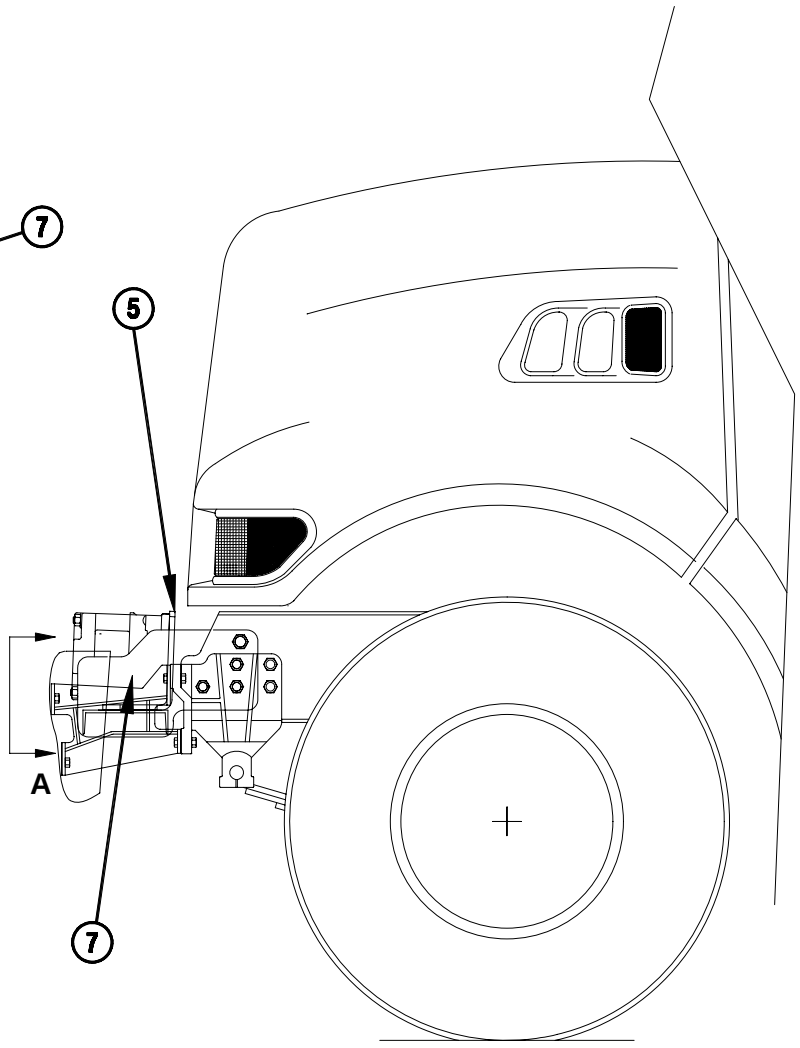
REF	PART NO.	DESCRIPTION	REQ'D
1	311-1635	BRACKET, pump	1
2	030-0705-009	DRIVELINE ASSEMBLY	1
3	047-1794	CAPSCREW – 7/16 – 20NC x 1"	4
4	047-2193	SETSCREW	2
5	263-0042	WIRE, lock	1
6	311-1634-00L	BRACKET, bumper extension – left hand	1
7	311-1634-00R	BRACKET, bumper extension – right hand	1
8	FS521100	WASHER, flat – 1/2"	6
9	FS231100	NUT, lock – 1/2" – 13NC	6
10	FS551000	WASHER, lock – 7/16"	4
11	FS071124	CAPSCREW – 1/2" – 13NC x 1-1/2"	4
12	FS021134	BOLT, carriage – 1/2" – 13NC x 2-1/2"	4

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PUMP MOUNT KIT for FORD LOUISVILLE CHASSIS
272-8418



VIEW A-A



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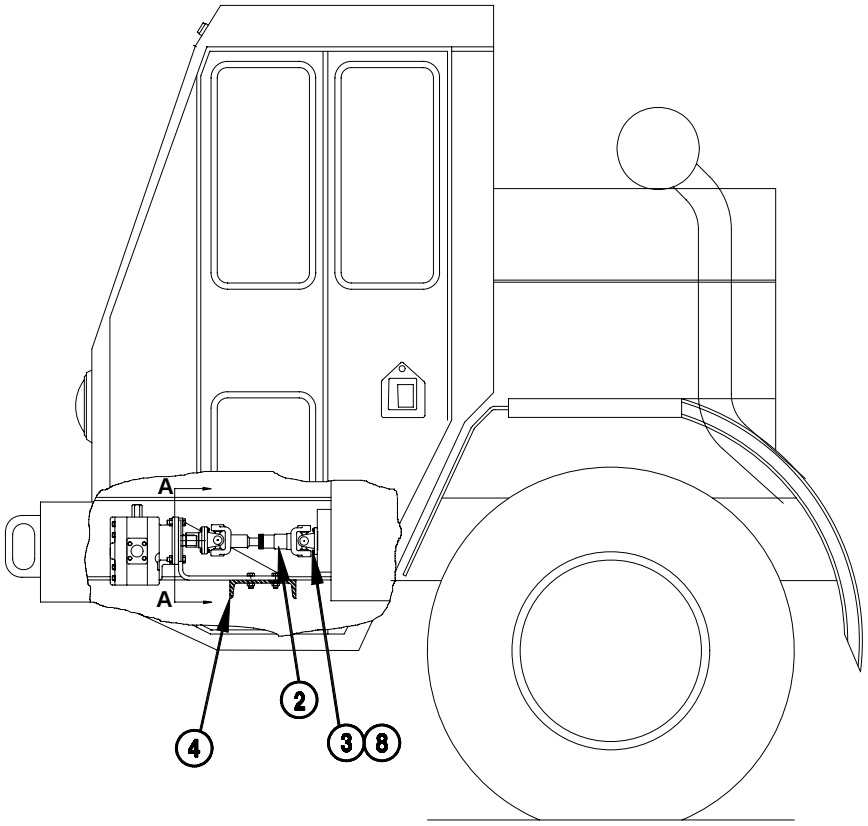
FORMULA 5000

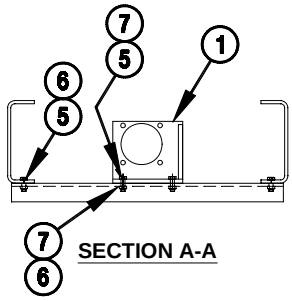
PUMP MOUNT KIT for FORD LOUISVILLE CHASSIS
272-8418

REF	PART NO.	DESCRIPTION	REQ'D
1	030-0705-009	DRIVE LINE	1
2	047-1794	CAPSCREW – 7/16" - 20NC x 1"	4
3	047-2193	SETSCREW	2
4	177-2070	CHANNEL, pump support	1
5	211-3298	BRACKET, pump	1
6	263-0042	WIE, lock	1
7	311-0210	BRACKET, pump	2
8	FS511000	WASHER, lock – 7/16"	4

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PUMP MOUNT KIT for CRANE CARRIER CHASSIS
272-5860





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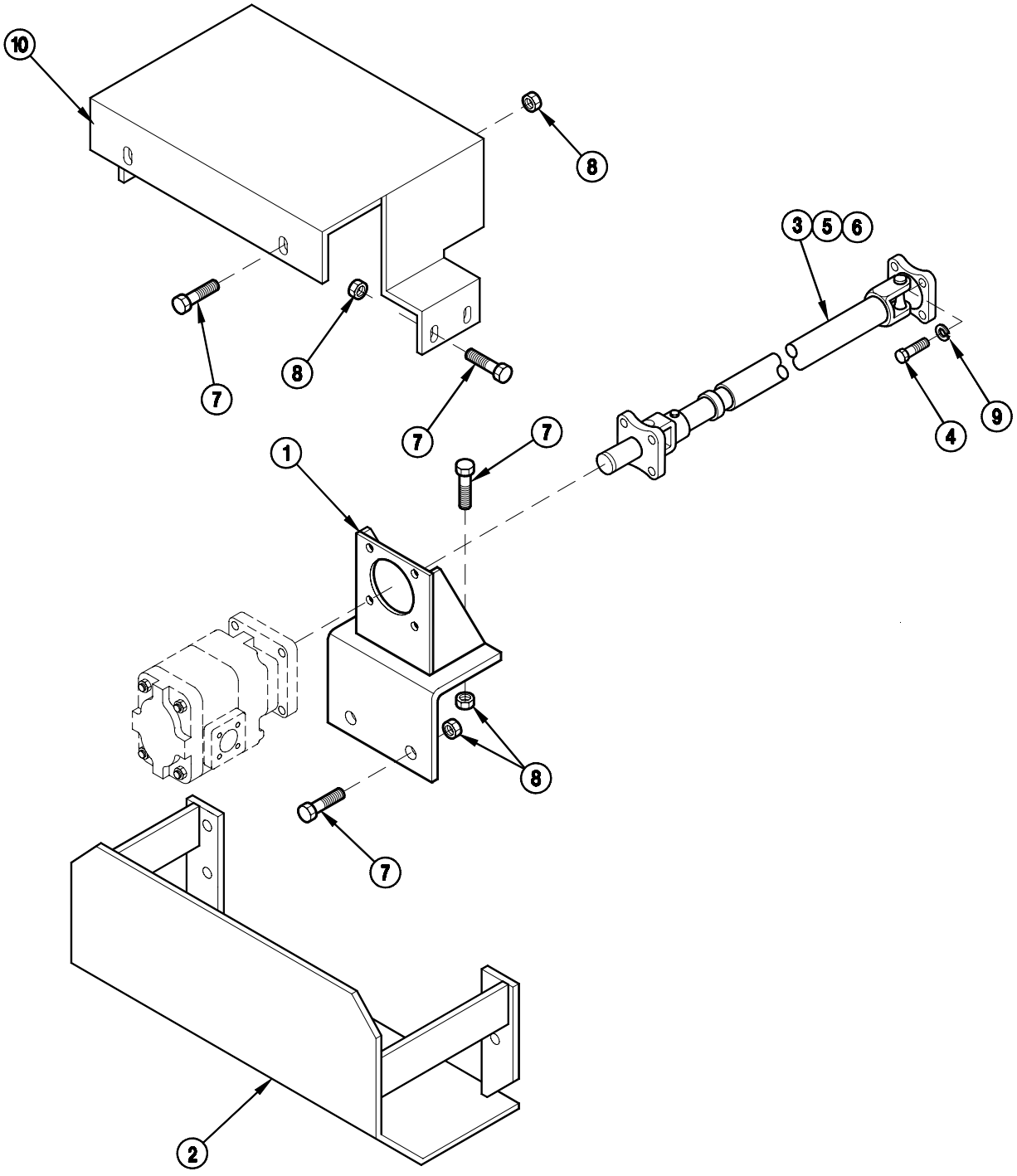
FORMULA 5000

PUMP MOUNT KIT for CRANE CARRIER CHASSIS
272-5860

REF	PART NO.	DESCRIPTION	REQ'D
1	211-4033	BRACKET, pump	1
2	030-0617	DRIVE LINE	1
3	047-1794	CAPSCREW – 7/16 – 20NF x 1"	4
4	177-2407	SUPPORT pump bracket	1
5	FS071122	CAPSCREW – 1/2" – 13NC x 1-1/4"	8
6	FS231100	NUT, lock – 1/2" – 13NC	12
7	FS511100	WASHER, flat – 1/2"	8
8	FS551000	WASHER, lock – 7/16"	4

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PUMP MOUNT KIT for WX VOLVO CHASSIS
272-5090 – WITHOUT PUMP COVER
272-5090-01 – WITH PUMP COVER



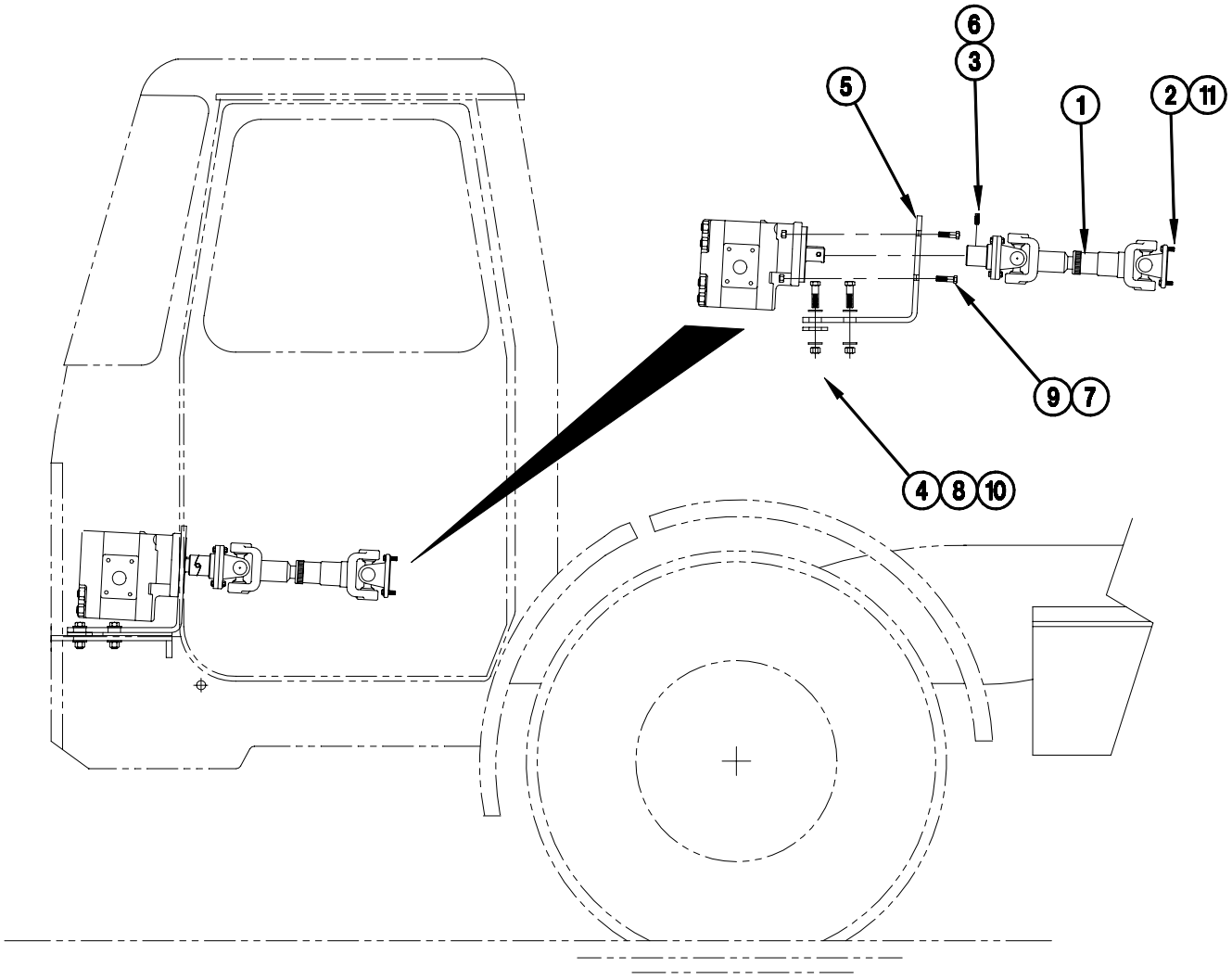
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PUMP MOUNT KIT for WX VOLVO CHASSIS
272-5090 – WITHOUT PUMP COVER
272-5090-01 – WITH PUMP COVER

REF	PART NO.	DESCRIPTION	REQ'D
1	112-8335	COVER, pump	1
2	211-5511	GUARD, pump	1
3	211-3272	BRACKET, pump mounting	1
4	FS231100	NUT, lock – 1/2" – 13NC	A/R
5	FS071124	CAPSCREW – 1/2" – 13NC x 1-1/2"	A/R
6	030-0705-005	DRIVE LINE	1
7	047-2193	SETSCREW	2
8	263-0042	WIRE, lock	1
9	047-1794	BOLT, drive line	4
10	FS551000	WASHER, lock – 7/16"	4
11	FS190400	FITTING, grease	1

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FRONT MOUNT KIT for WXLL VOLVO CHASSIS
272-8016



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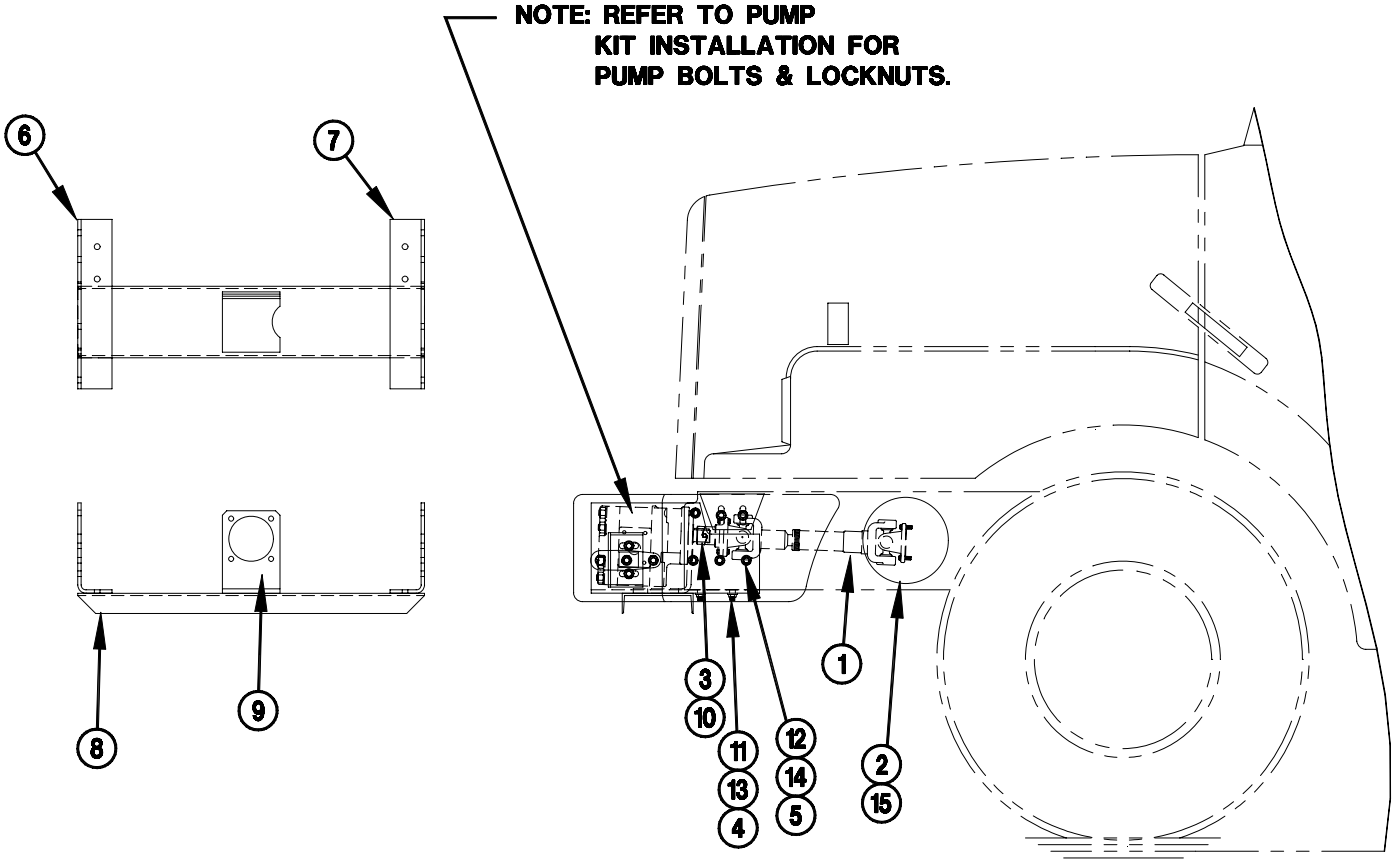
FORMULA 5000

FRONT MOUNT KIT for WXLL VOLVO CHASSIS
272-8016

REF	PART NO.	DESCRIPTION	REQ'D
1	030-0705-004	DRIVE LINE	1
2	047-1794	BOLT, drive line	4
3	047-2193	SETSCREW	2
4	055-1391-007	WASHER, flat – 5/8"	8
5	211-4792	BRACKET, pump	1
6	263-0042	LOCKWIRE	1
11	FS071130	CAPSCREW – 1/2" – 13NC x 2"	4
12	FS081332	CAPSCREW – 5/8" – 11NC x 2-1/4"	4
13	FS231100	NUT, lock – 1/2" – 13NC	4
14	FS231300	NUT, lock – 5/8" – 11NC	4
15	FS551000	WASHER, lock – 7/16"	4

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FRONT MOUNT KIT for WG VOLVO CHASSIS
272-8024



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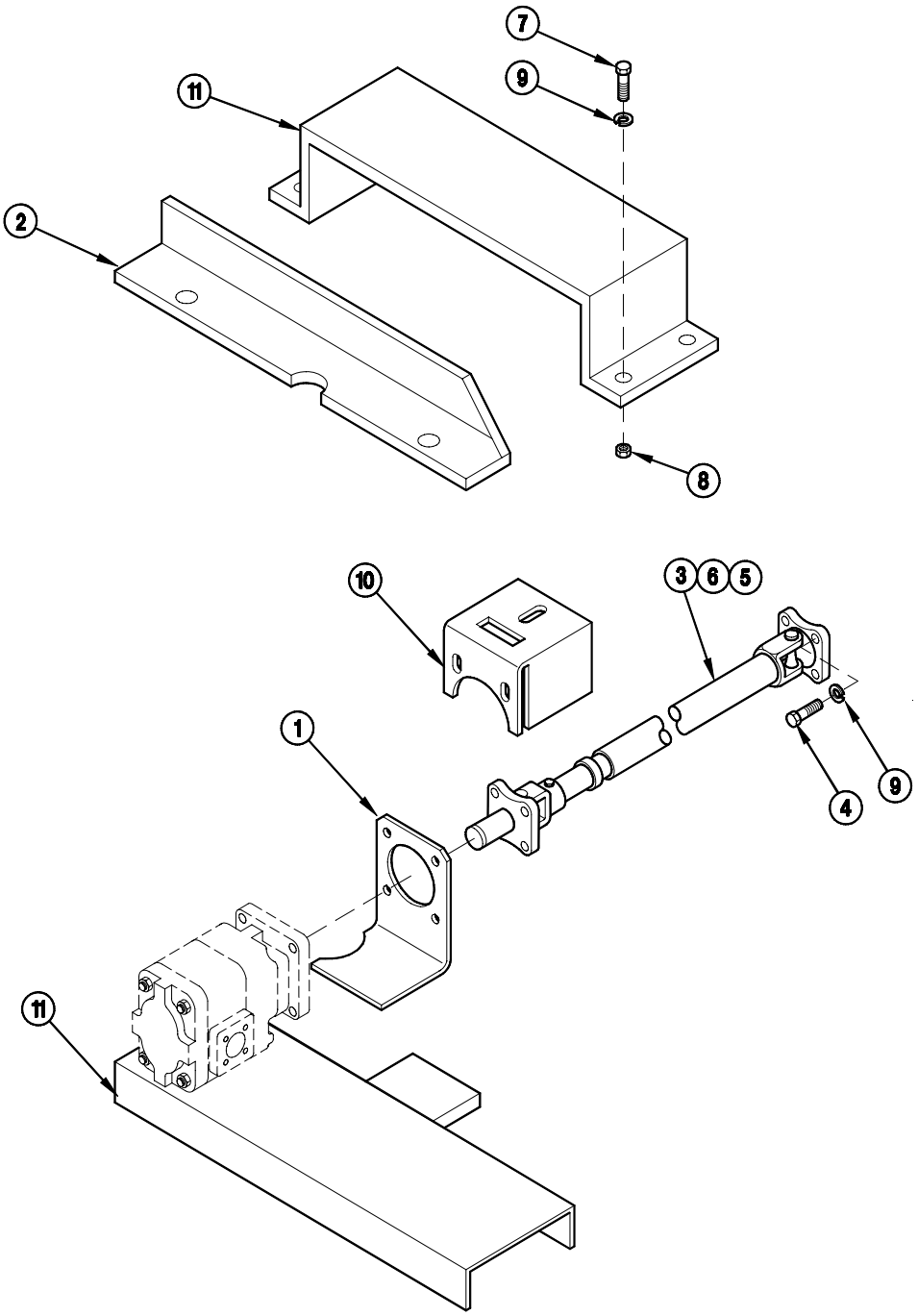
FORMULA 5000

FRONT MOUNT KIT for WG VOLVO CHASSIS
272-8024

REF	PART NO.	DESCRIPTION	REQ'D
1	030-0705-006	DRIVE LINE	1
2	047-1794	BOLT, drive line	4
3	047-2193	SETSCREW	2
4	055-1391-005	WASHER, flat – 1/2"	8
5	055-1391-007	WASHER, flat – 5/8"	12
6	080-1604-001	EXTENSION, bumper – right hand	1
7	080-1604-002	EXTENSION, bumper – left hand	1
8	177-4000	SUPPORT, pump	1
9	211-3298	BRACKET, pump	1
10	263-0042	LOCKWIRE	1
11	FS081132	CAPSCREW – 1/2" – 13NC x 2-1/4"	4
12	FS081334	CAPSCREW – 5/8" – 11NC x 2-1/2"	6
13	FS231100	NUT, lock – 1/2" – 13NC	4
14	FS231300	NUT, lock – 5/8" – 11NC	6
15	FS551000	WASHER, lock – 7/16"	4

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PUMP MOUNT KIT for MR MACK CHASSIS
272-3460



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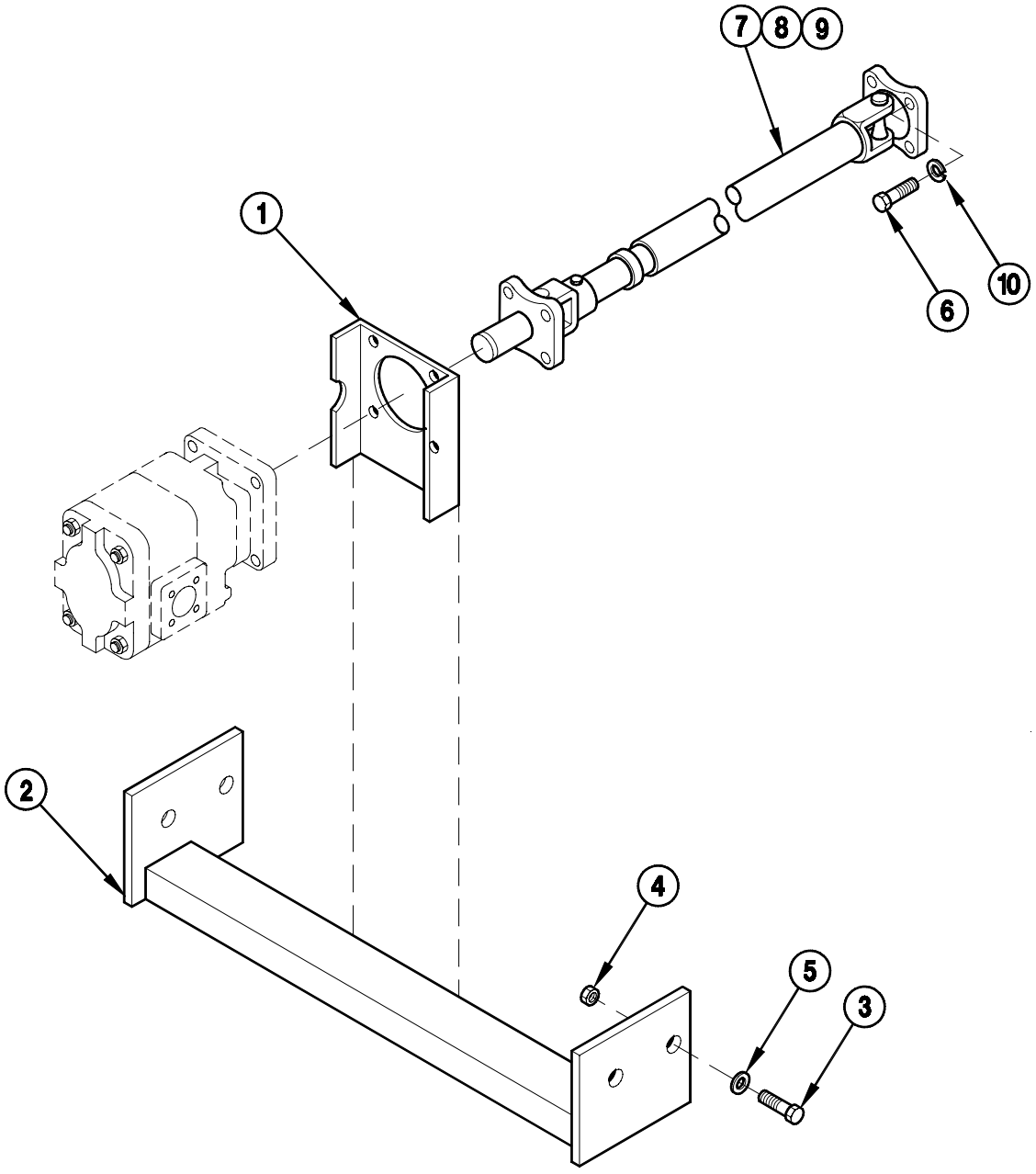
FORMULA 5000

PUMP MOUNT KIT for MR MACK CHASSIS
272-3460

REF	PART NO.	DESCRIPTION	REQ'D
1	211-3298	BRACKET, pump mounting	1
2	035-2592	GUARD, pump	1
3	030-705-003	DRIVE LINE	1
4	047-1794	CAPSCREW – 7/16 – 20NF x 1"	4
5	047-2193	SETSCREW	2
6	263-0042	WIRE, lock	1
7	FS071122	CAPSCREW – 1/2" – 13NC x 1"	A/R
8	FS231100	NUT, lock – 1/2" – 13NC	A/R
9	FS551000	WASHER, lock – 7/16"	4
10	211-6917	COVER, pump	1
11	112-9882	PANEL, cover	1
12	177-3999	SUPPORT, bracket	1

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MOUNT KIT for KENWORTH/PETERBILT CHASSIS
272-6486



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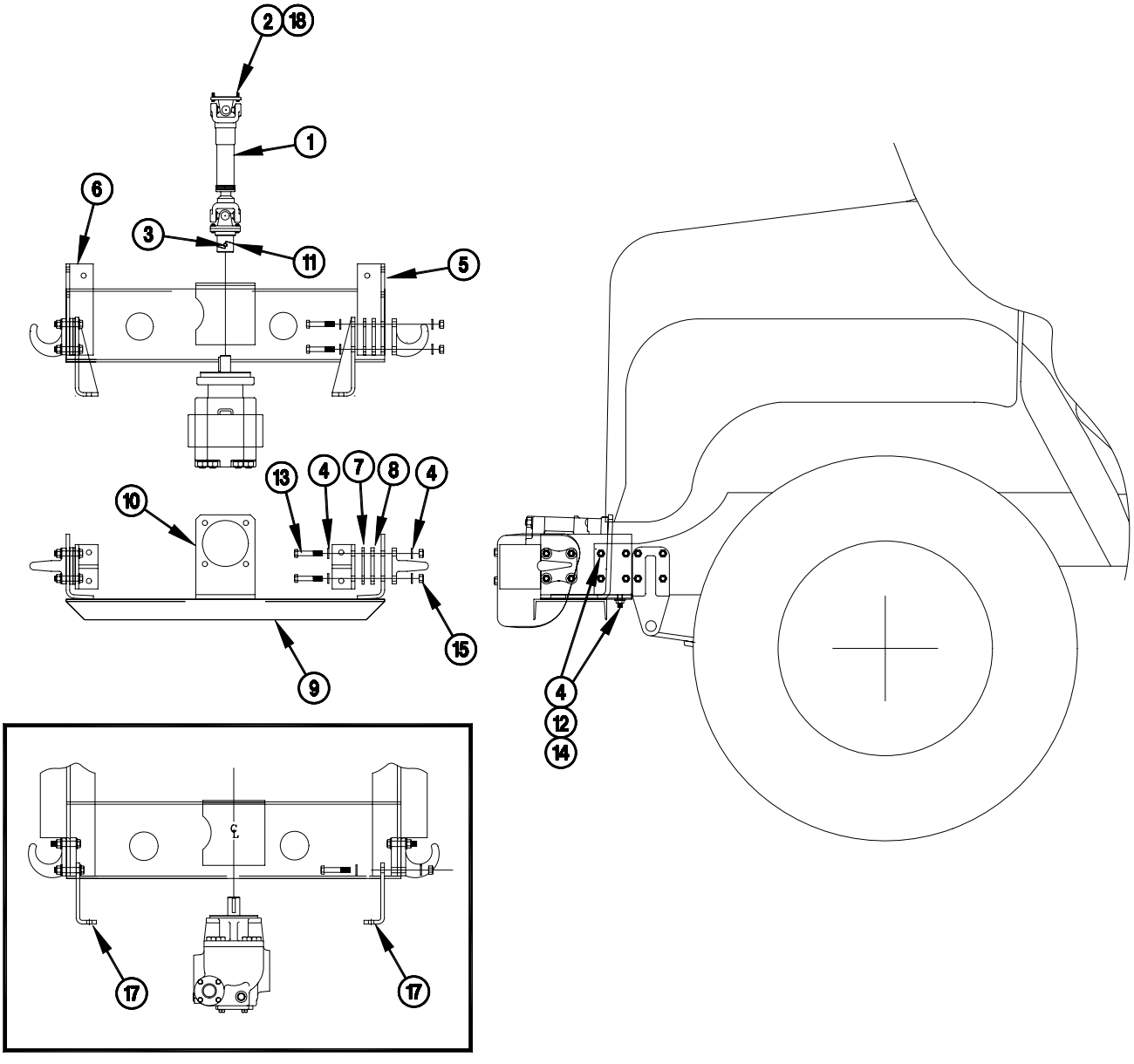
FORMULA 5000

MOUNT KIT for KENWORTH/PETERBILT CHASSIS
272-6486

REF	PART NO.	DESCRIPTION	REQ'D
1	211-6916	BRACKET, pump	1
2	272-6486-0 01	BRACKET, pump support	1
3	FS071560	CAPSCREW – 3/4" – 10NC x 5"	4
4	FS231500	NUT, lock – 3/4" – 10NC	4
5	055-1391-008	WASHER, flat – 3/4"	8
6	047-1794	CAPSCREW – 7/16" – 20NF x 1"	4
7	047-2193	SETSCREW	2
8	030-0705-006	DRIVE LINE	1
9	263-0042	WIRE, lock	1
10	FS551000	WASHER, lock – 7/16"	4

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PUMP MOUNT KIT for NAVISTAR CHASSIS
272-8040 – WITHOUT EXT. BUMPER
272-8040-001 – WITH EXT. BUMPER



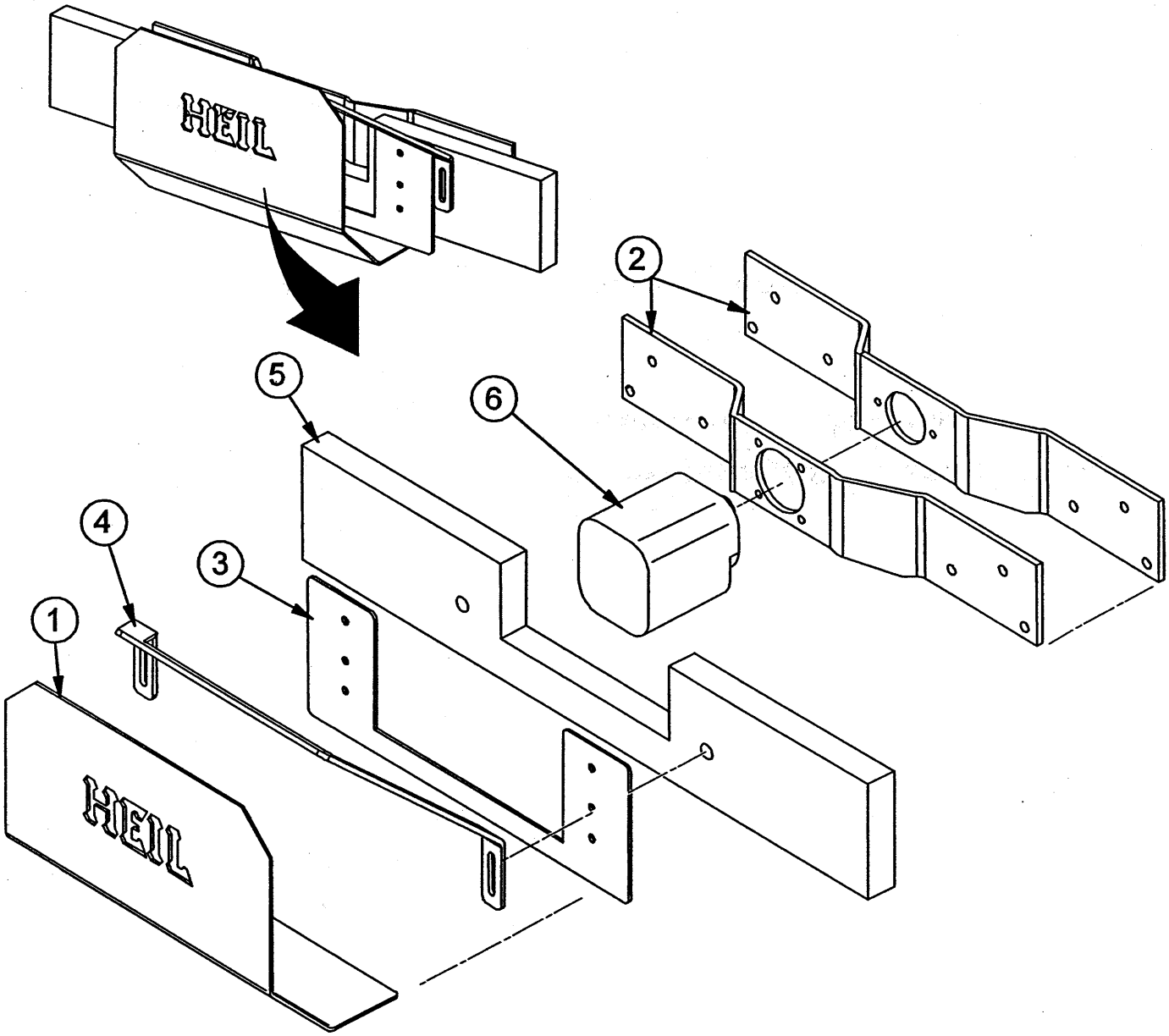
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PUMP MOUNT KIT for NAVISTAR CHASSIS
272-8040 – WITHOUT EXT. BUMPER
272-8040-001 – WITH EXT. BUMPER

REF	PART NO.	DESCRIPTION	REQ'D
1	030-0705-009	DRIVE LINE	1
2	047-1794	CAPSCREW – 7/16" – 20NC x 1"	4
3	047-2193	SETSCREW	2
4	055-1391-005	WASHER, flat hardened	36
5	080-1605-001	EXTENSION, bumper – left hand	1
6	080-1605-002	EXTENSION, bumper – right hand	1
7	080-1605-003	SPACER – 1/4"	2
8	080-1605-004	SPACER – 3/8"	2
9	177-4450	SUPPORT, pump	1
10	211-3298	BRACKET, pump	1
11	263-0042	WIRE, lock	1
12	FS071130	CAPSCREW – 1/2" – 13NC x 2"	10
13	FS111136	CAPSCREW – 1/2" – 20NF x 2-3/4"	4
14	FS231100	NUT, lock – 1/2" – 13NC	10
15	FS241100	NUT, lock – 1/2" – 20NF	4
16	FS551000	WASHER, lock – 7/16"	4
17	311-0107	BRACKET, bumper extension (for 272-8040-01 kit)	2

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PUMP BRACKET ASSEMBLY for MACK GRANITE 372-2749



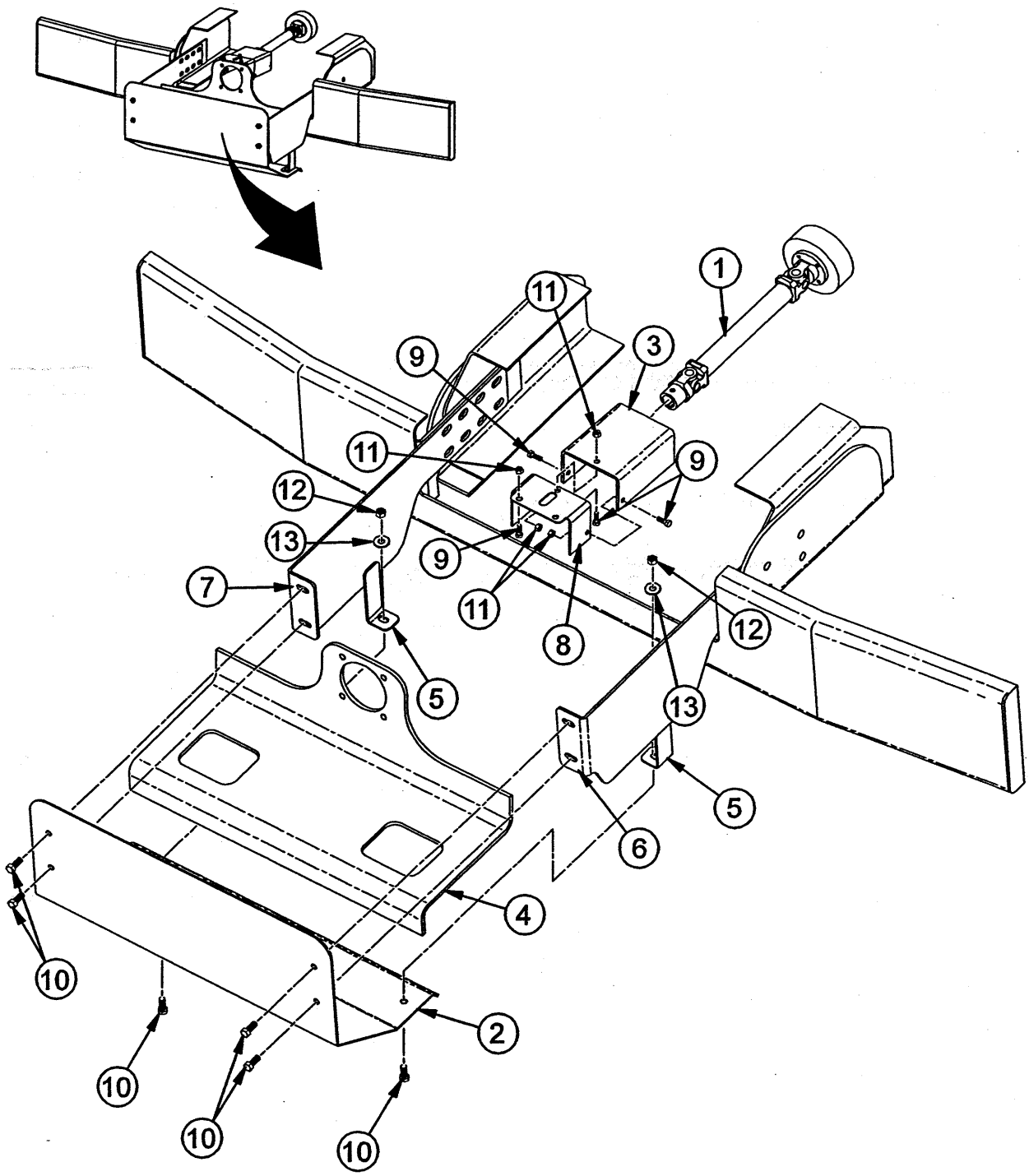
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PUMP BRACKET ASSEMBLY for MACK GRANITE 372-2749

REF	PART NO.	DESCRIPTION	REQ'D
1	211-5511-011	GUARD, pump	1
2	311-3294-SER	BRACKET, pump mount	1
3	NSS	SUPPORT	1
4	NSS	STIFFNER	1
5	NSS	BRACKET	1

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PUMP BRACKET ASSEMBLY for GMC CHASSIS 372-3074



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PUMP BRACKET ASSEMBLY for GMC CHASSIS 372-3074

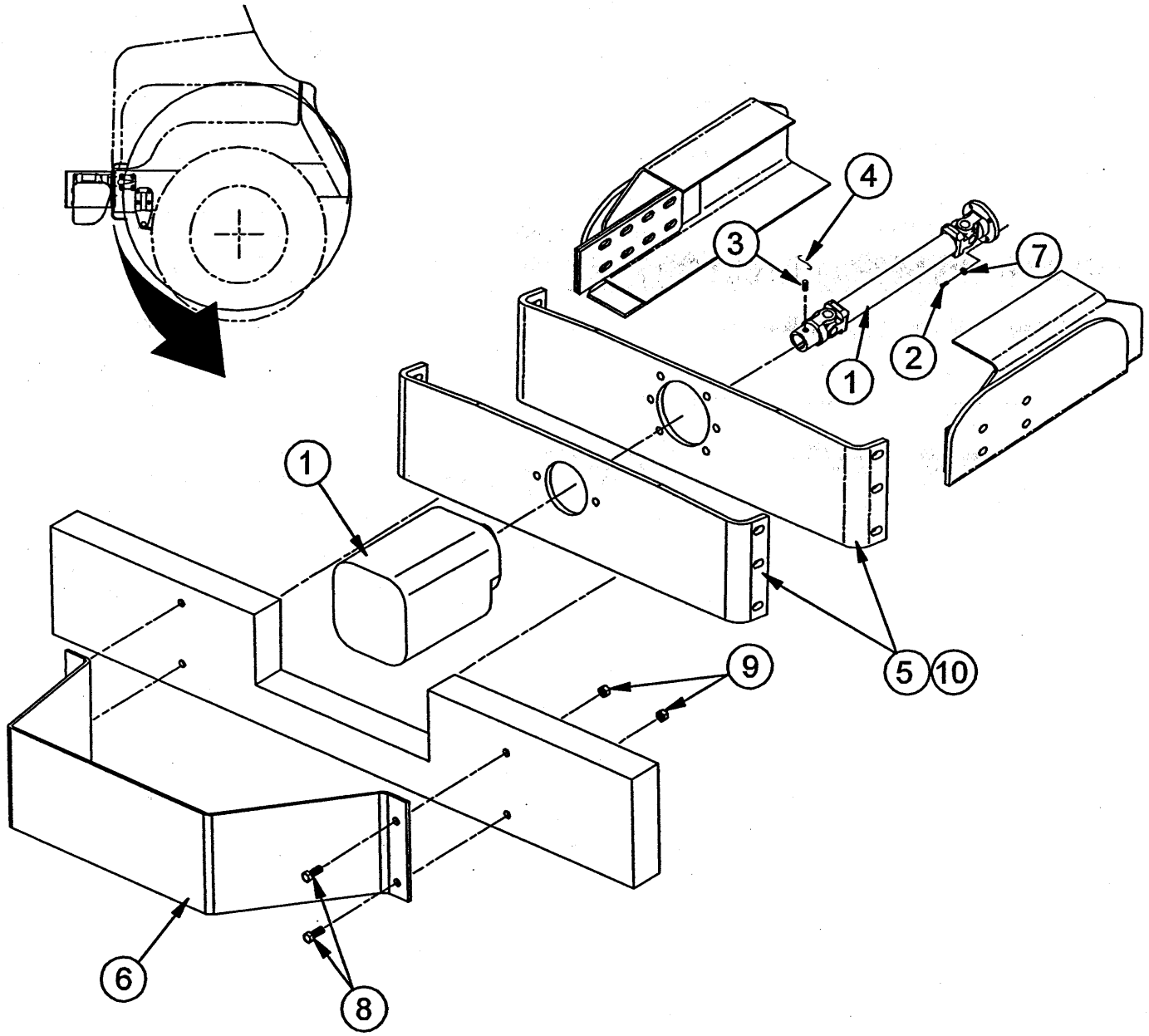
REF	PART NO.	DESCRIPTION	REQ'D
1	030-0705	DRIVELINE	1
2	035-3487	GUARD, pump	1
3	035-3488	GUARD, driveline	1
4	126-6795	BRACE, pump bracket	1
5	126-6796	BRACE, pump guard	2
6	234-2628	PLATE, pump bracket – LH	1
7	234-2629	PLATE, pump bracket – RH	1
8	311-3086	GUARD, pump shaft	1
9	FS070920	CAPSCREW – 3/8" – 16NC x 1"	5
10	FS071122	CAPSCREW – 1/2" – 13NC x 1-1/4"	6
11	FS230900	NUT, lock – 3/8" – 16NC	5
12	FS231100	NUT, lock – 1/2" – 13NC	6
13	FS511100	WASHER, flat – 1/2"	6

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FRONT MOUNT PUMP INSTALLATION for INTERNATIONAL 5000i, 8000i, 9000i CHASSIS 372-0762



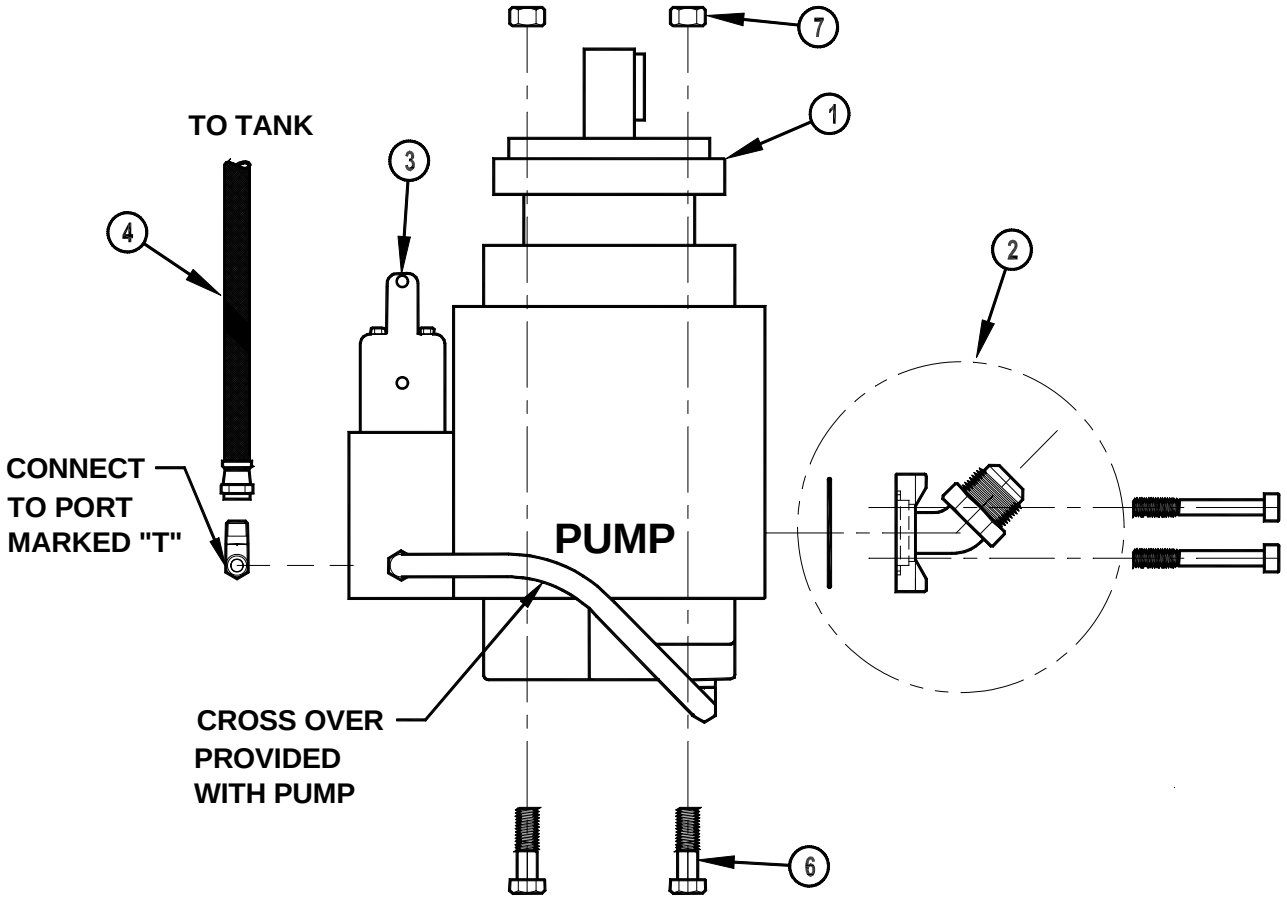
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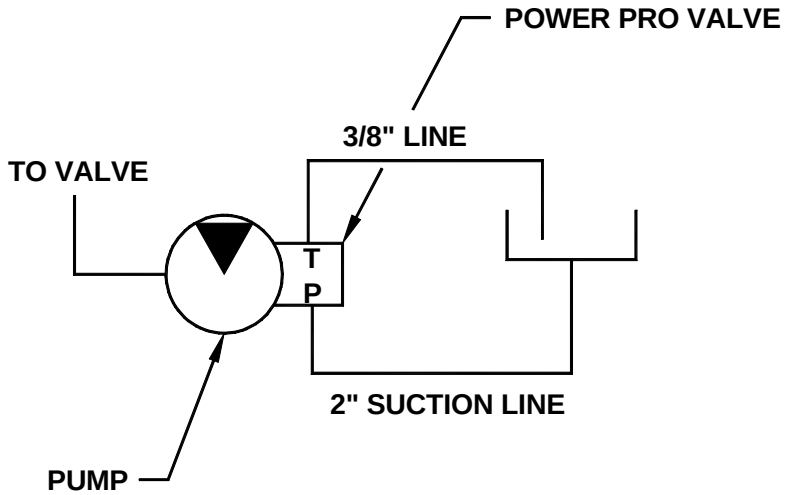
FRONT MOUNT PUMP INSTALLATION for INTERNATIONAL 5000i, 8000i, 9000i CHASSIS 372-0762

REF	PART NO.	DESCRIPTION	REQ'D
1	030-0705-009	DRIVELINE ASSEMBLY	1
2	047-1794	CAPSCREW – 7/16 – 20NC x 1"	4
3	047-2193	SETSCREW	2
4	263-0042	WIRE, lock	1
5	311-1979	BRACKET, pump mounting	1
6	311-1980	COVER, front	1
7	FS551000	WASHER, lock – 7/16"	4
8	FS071122	CAPSCREW – 1/2" – 13NC x 1-1/4"	4
9	FS231100	NUT, lock – 1/2" – 13NC	4
10	311-1635	BRACKET, pump	1

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FRONT MOUNT PUMP KIT with OVERSPEED
272-5855





PLUMBING DIAGRAM

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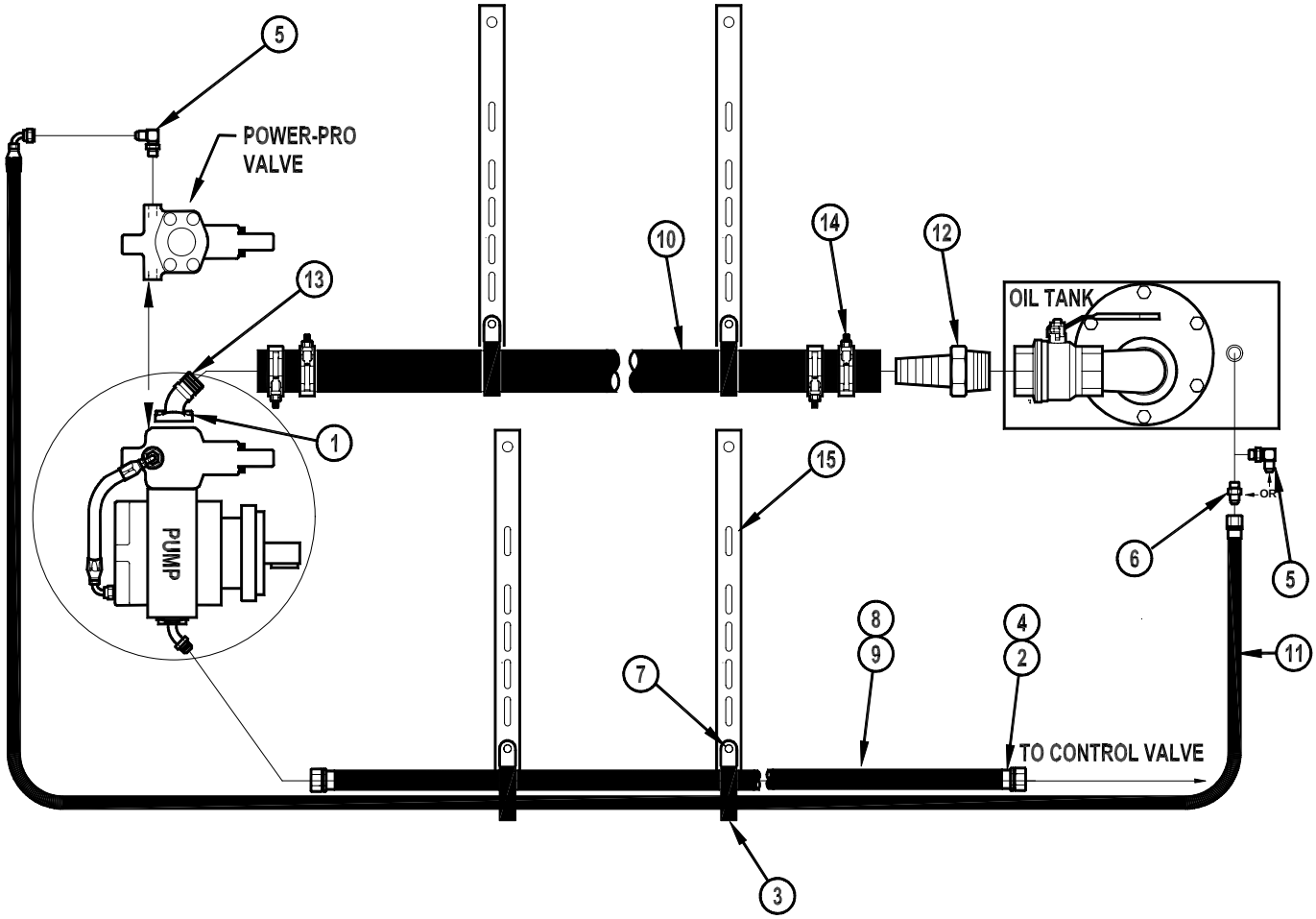
FORMULA 5000

FRONT MOUNT PUMP KIT with OVERSPEED
272-5855

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1893	PUMP, hydraulic with dry valve (see section 5)	1
2	054-8722	FLANGE KIT, 45° split	1
	054-8722-001	ELBOW, 45°	1
	026-3932-020	O-RING	1
	054-8722-002	HALVES, flange	2
	FS071022	CAPSCREW – 7/16" – 14NC x 1-1/4"	4
	FS551000	WASHER, lock – 7/16"	4
3	272-5354	SHIFT KIT, electric air (see section 5)	1
4	272-5630	HOSE KIT (see page 4.xx)	1
5	108-4545	CONTROLLER, overspeed	1
6	FS071126	CAPSCREW – 1/2" – 13NC x 1-3/4"	4
7	FS231100	NUT, lock – 1/2" – 13NC	4

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FRONT MOUNT PUMP HOSE KIT
272-5630



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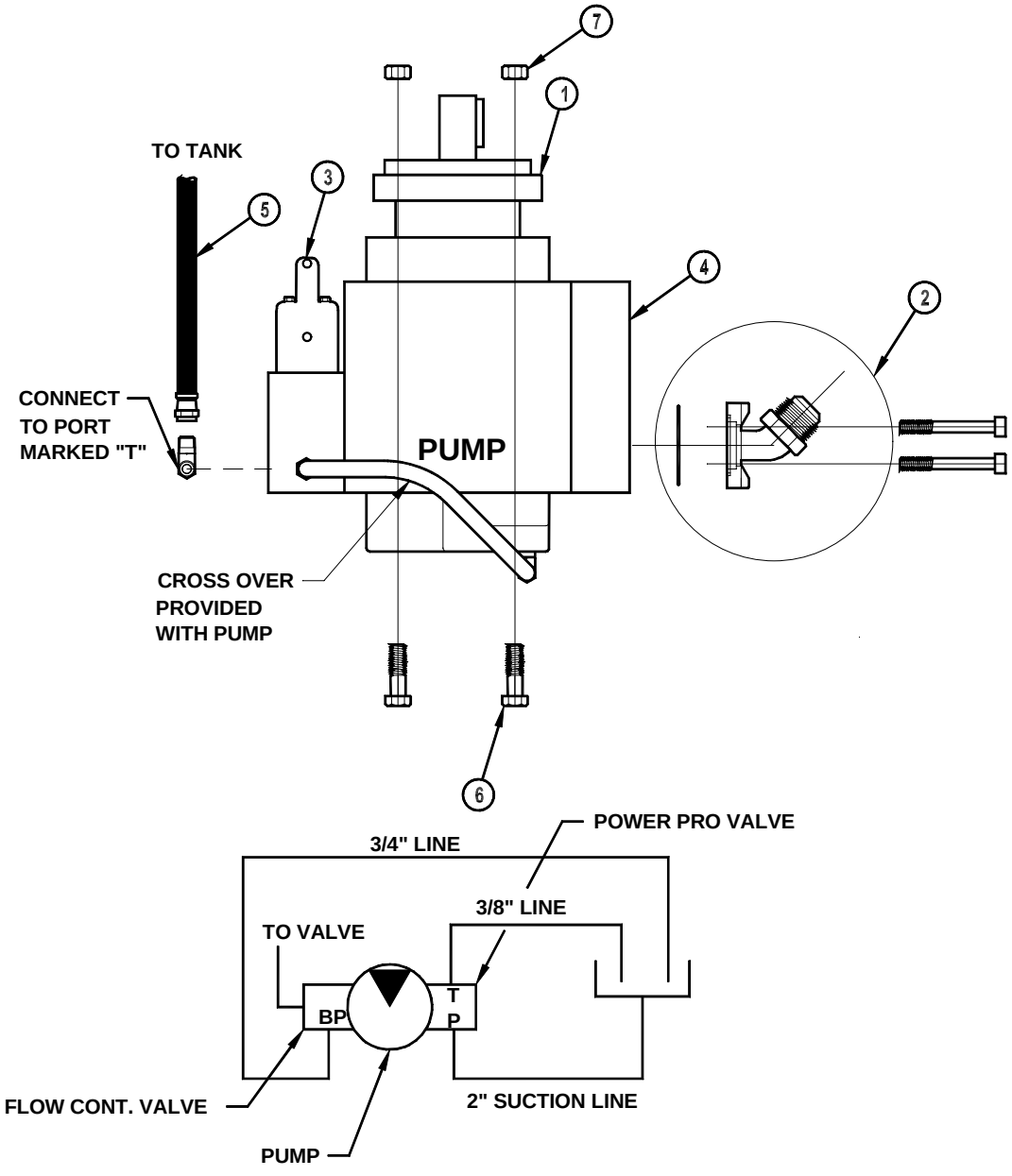
FORMULA 5000

FRONT MOUNT PUMP HOSE KIT
272-5630

REF	PART NO.	DESCRIPTION	REQ'D
1	054-8736-005	FLANGE KIT – 4- bolt – 1-1/2"	1
	054-8736-034	FLANGE, halves	2
	054-8736-013	O-RING	1
	FS081144	CAPSCREW – 1/2" – 13NC x 3-1/2"	4
	FS541000	WASHER, lock – 1/2"	4
2	035-2727	GUARD, hose	14ft
3	036-1295-007	CLAMP, hose – 2-7/16"	8
4	036-1499	CLAMP, bandit – fiber guard	2
5	054-3340-005	ELBOW, 90° - 3/8" SAE	2
6	054-3341-005	ADAPTER, straight – 3/8" SAE	1
7	FS070920	CAPSCREW – 3/8" – 16NC x 1"	8
	FS230900	NUT, lock – 3/8" – 16NC	8
8	057-1719-010	FITTING, pressure hose	2
9	057-1719	HOSE, pressure	14ft
	057-1719-004	HOSE, pressure-with reuseable end-(shipper units)	1
10	057-2172	HOSE, suction – 2" x 16ft	1
11	057-2223-001	HOSE, hydraulic – 3/8" with reuseable end	1
12	058-8579-006	FITTING, suction hose	1
13	074-4486-008	ELBOW, 45° (check pump kit for correct elbow)	1
	074-4487-008	ELBOW, 90° (check pump kit for correct elbow)	1
14	074-4498-032	CLAMP, suction hose	4
15	211-9851	BRACKET, hose support	4

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FRONT MOUNT PUMP KIT with FLOW CONTROL
272-5857



PLUMBING DIAGRAM

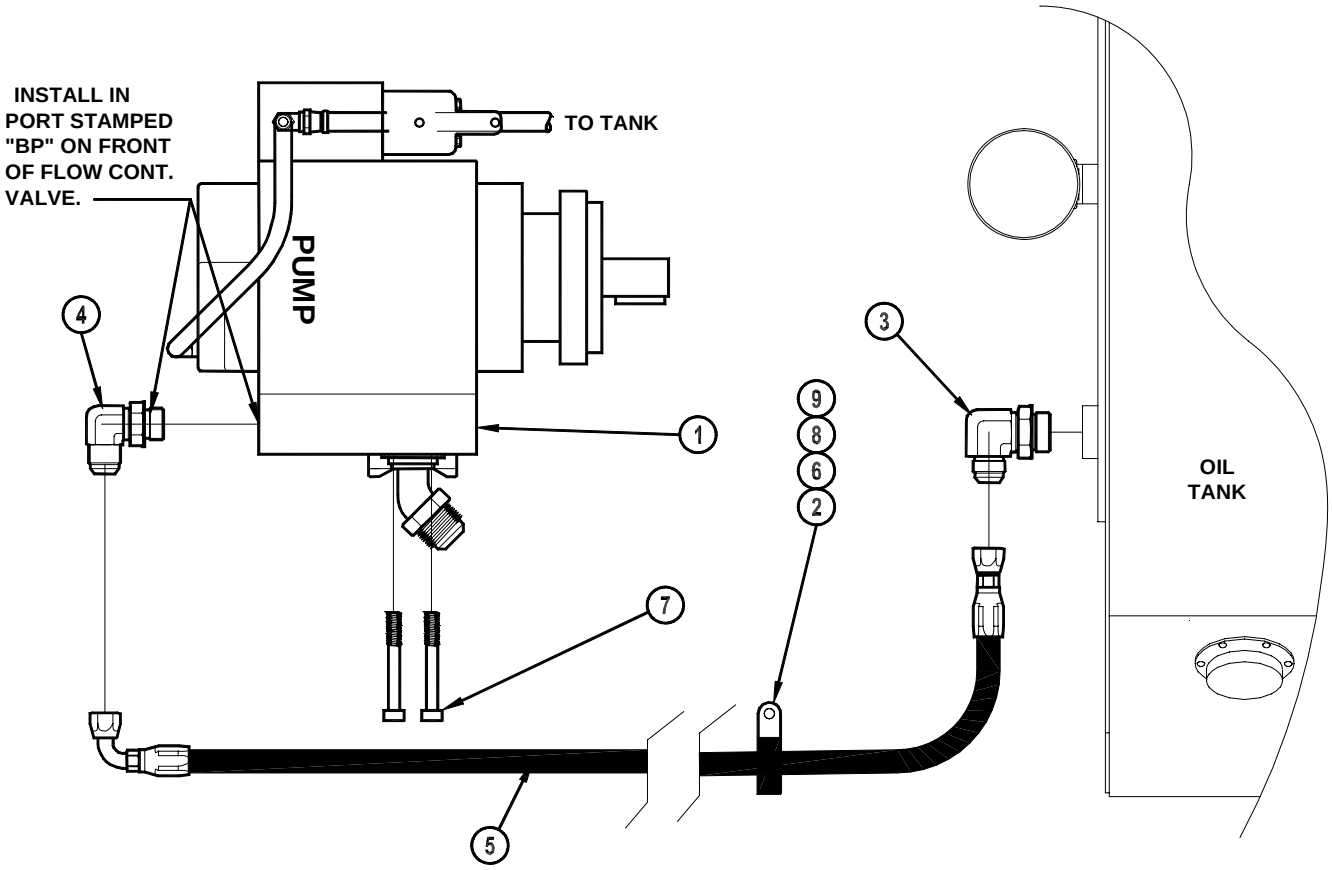
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FRONT MOUNT PUMP KIT with FLOW CONTROL
272-5857

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1893	PUMP, hydraulic and dry valve (see section 5)	1
2	054-8722	FLANGE KIT, 45° split	1
	054-8722-00	ELBOW, 45°	1
	026-3932-020	O-RING	1
	054-8722-02	HALVES, flange	2
	FS071022	CAPSCREW – 7/16" – 14NC x 1-1/4"	4
	FS551000	WASHER, lock – 7/16"	4
3	272-5355	SHIFT KIT, electric/air (see page 4.74)	1
4	272-5898	FLOW CONTROL (see page 4.54)	1
5	272-5630	HOSE KIT (see page 4.50)	1
6	FS071126	CAPSREW – 1/2" – 13NC x 1-3/4"	4
7	FS231100	NUT, lock – 1/2" – 13NC	4

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FLOW CONTROL KIT
272-5898



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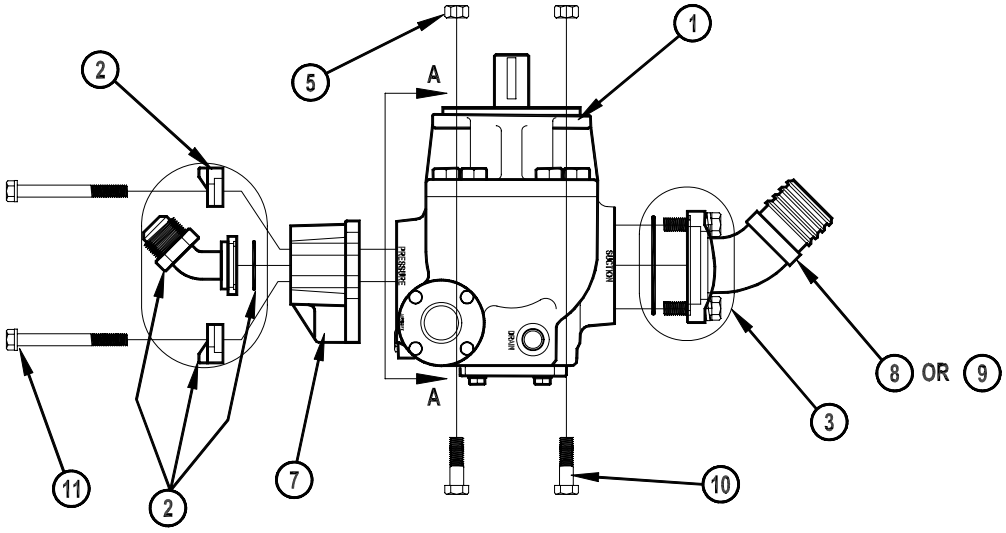
FORMULA 5000

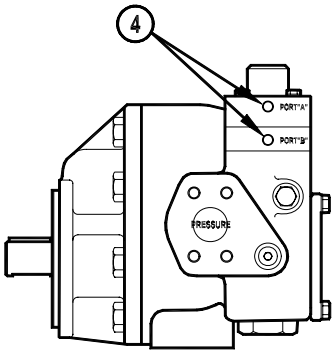
FLOW CONTROL KIT
272-5898

REF	PART NO.	DESCRIPTION	REQ'D
1	031-5742	VALVE, flow control (see section 5)	1
2	036-1478	CLAMP, support	4
3	54-3237-003	ELBOW, 90°	1
4	054-3340-006	ELBOW, 90°	1
5	057-2224-001	HOSE, hydraulic – with reuseable ends	1
6	FS070920	CAPSCREW – 3/8" – 16NC x 1"	4
7	FS131042	CAPSCREW, socket head – 7/16" – 14nc x 3-1/4"	4
8	FS230900	NUT, lock – 3/8" – 16NC	4
9	FS510900	WASHER, flat – 3/8"	8

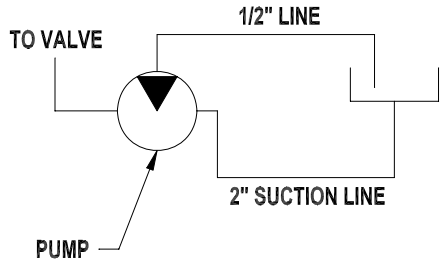
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FRONT MOUNT PUMP KIT with FLOW CONTROL
272-8460





VIEW A-A



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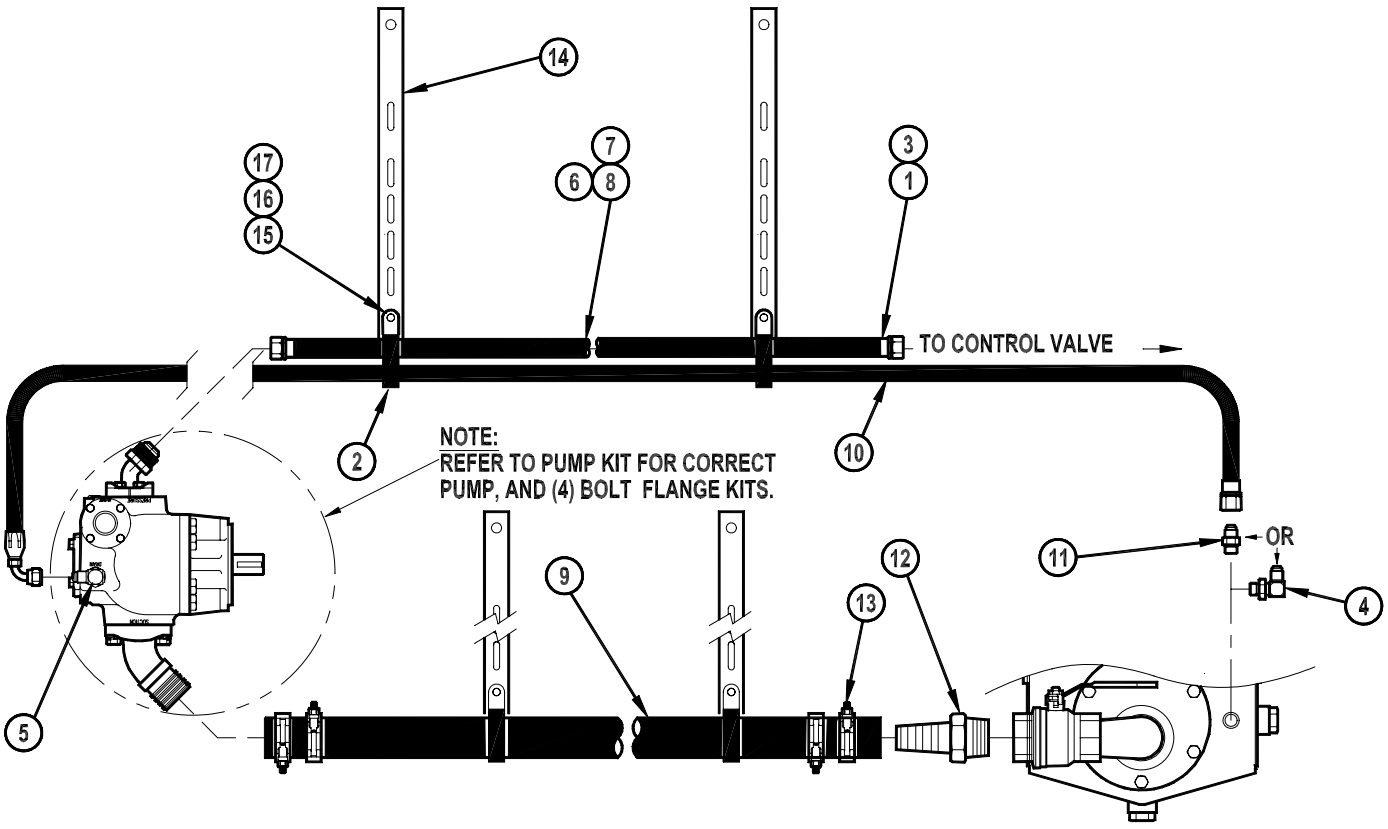
FORMULA 5000

FRONT MOUNT PUMP KIT with FLOW CONTROL
272-8460

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1995	PUMP, hydraulic (see section 5)	1
2	054-8722	FLANGE KIT, 45° split – 1-1/4"	1
	054-8722-001	ELBOW, 45°	1
	026-3932-020	O-RING	1
	054-8722-002	FLANG, halves	2
3	054-8736-006	FLANGE KIT, 4-bolt – 2"	1
	054-8736-036	FLANGE, halves	2
	054-9888-003	O-RING	1
	FS081144	CAPSCREW – 1/2" – 13NC x 3-1/2"	4
	FS541000	WASHER, lock – 1/2"	4
4	272-7973	AIR SHIFT KIT (see page 4.70)	1
5	FS231100	NUT, lock – 1/2" – 13NC	4
6	FS551000	WASHER, lock – 7/16"	4
7	31-5801-44	VALVE, flow regulator	1
8	54-8667-01	FITTING, 45° suction flange	1
9	54-8668-01	FITTING, 90° suction flange	1
10	FS071126	CAPSCREW – 1/2" – 13NC x 1-3/4"	4
11	FS081050	CAPSCREW – 7/16" – 14NC x 4"	4
12	272-8459	HOSE KIT, front mount (see page 4.58)	1

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FRONT MOUNT PUMP HOSE KIT
272-8459



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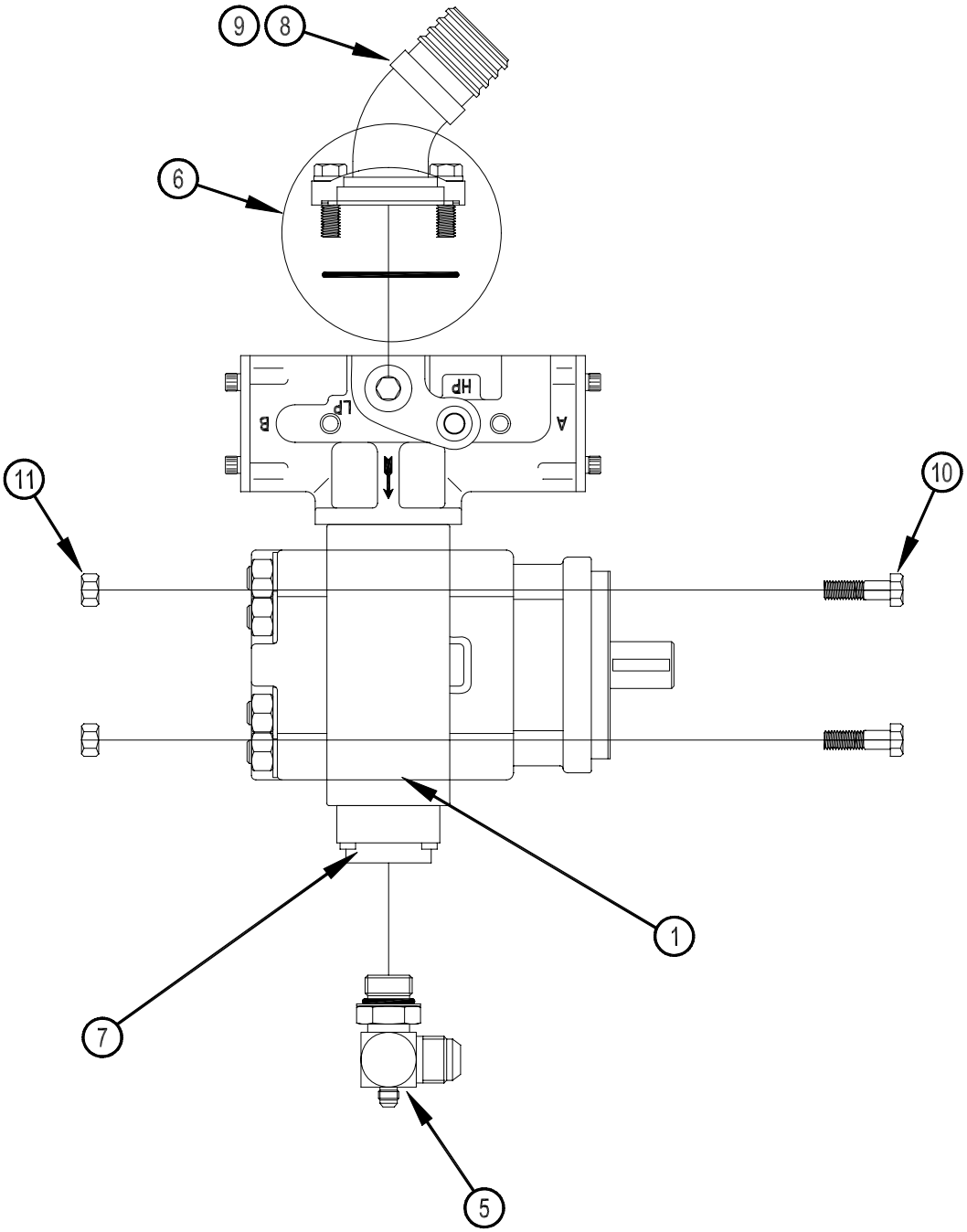
FORMULA 5000

FRONT MOUNT PUMP HOSE KIT
272-8459

REF	PART NO.	DESCRIPTION	REQ'D
1	035-2727	GUARD, fiber	17ft
2	036-1295-007	CLAMP – 2-7/16"	10
3	036-1499	clamp, BANDIT	2
4	054-3237-018	ELBOW, 90° reducing	1
5	054-3340-006	ELBOW, 90° male	1
6	FS520900	WASHER, flat – 3/8"	20
7	057-1719-010	FITTING, pressure hose	2
8	057-1719	HOSE, hydraulic – pressure	17ft
9	057-2172	HOSE, suction – 2"	17ft
10	057-2248-001	HOSE, hydraulic – with reuseable end – 1/2"	1
11	058-3205-022	REDUCER – 3/8" x 1/2"	1
12	058-8579-006	FITTING, suction hose	1
13	074-4498-032	CLAMP, suction hose	4
14	211-9851	BRACKET, hose support	6
15	FS070920	CAPSCREW – 3/8" – 16NC x 1"	10
16	FS230900	NUT, lock – 3/8" – 16NC	20

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FRONT MOUNT PUMP KIT
272-7153



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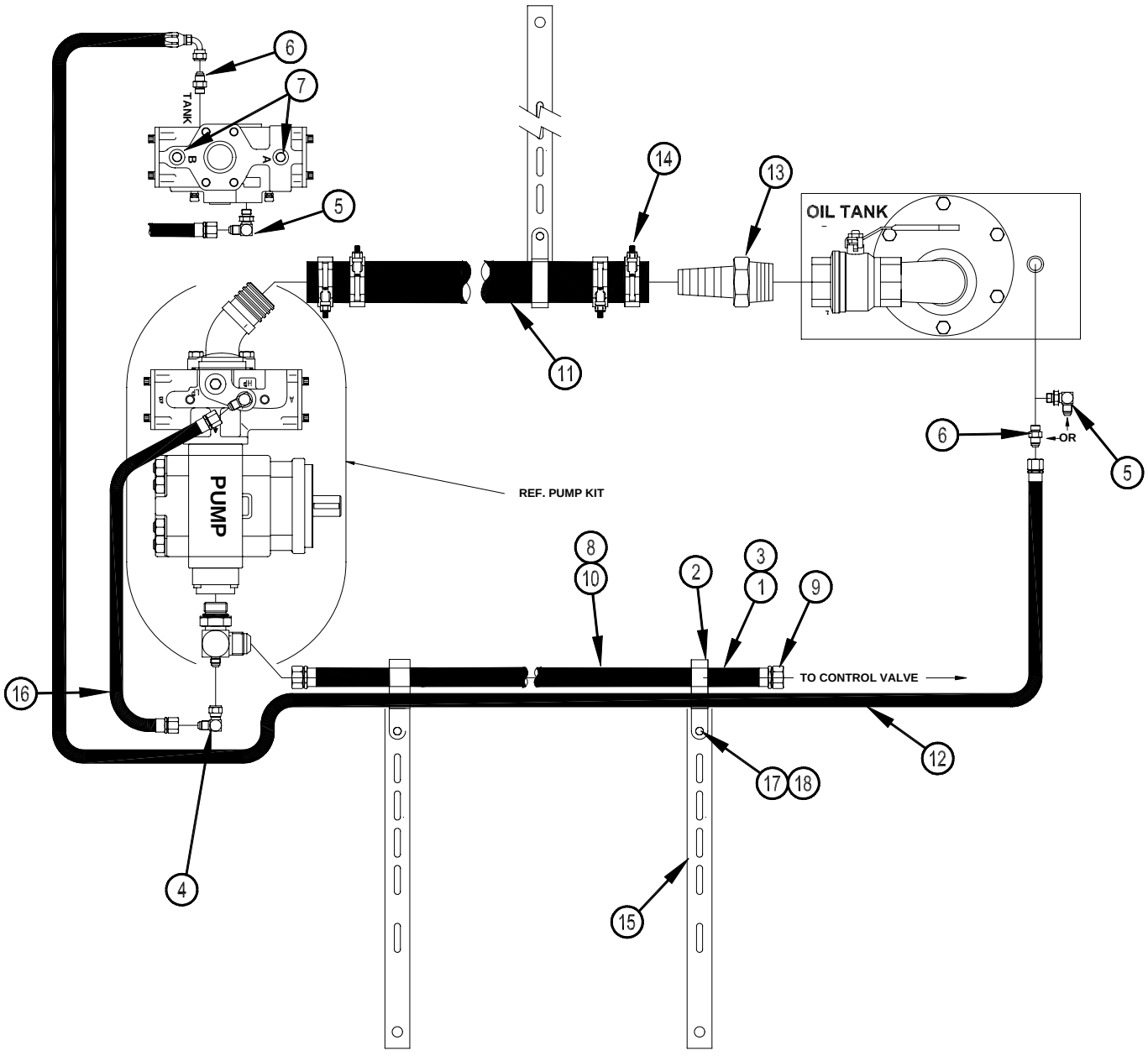
FORMULA 5000

FRONT MOUNT PUMP KIT
272-7153

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1870	PUMP, hydraulic with dry valve (see section 5)	1
2	272-7973	ELECTRIC/AIR SHIFT KIT (see page 4.70)	1
3	272-8423	HOSE KIT (see page 4.62)	1
5	054-8513	ELBOW, 90° with 3/8" spud	1
6	054-8736-006	FLANGE KIT, 4-bolt – 2"	1
	054-8736-036	FLANGE, half	2
	054-9888-003	O-RING	1
	FS081144	BOLT – 1/2" – 13NC x 3-1/2"	4
	FS541000	WASHER, lock – 1/2"	4
7	074-4458	FLANGE, o-ring	1
8	054-8667-001	ELBOW, 45° - 2" SAE	1
9	054-8668-001	ELBOW, 90° - 2" SAE	1
10	FS071126	CAPSCREW – 1/2" – 13NC x 1-3/4"	4
11	FS231100	NUT, lock – 1/2" – 13NC	4

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FRONT MOUNT HOSE KIT
272-8423



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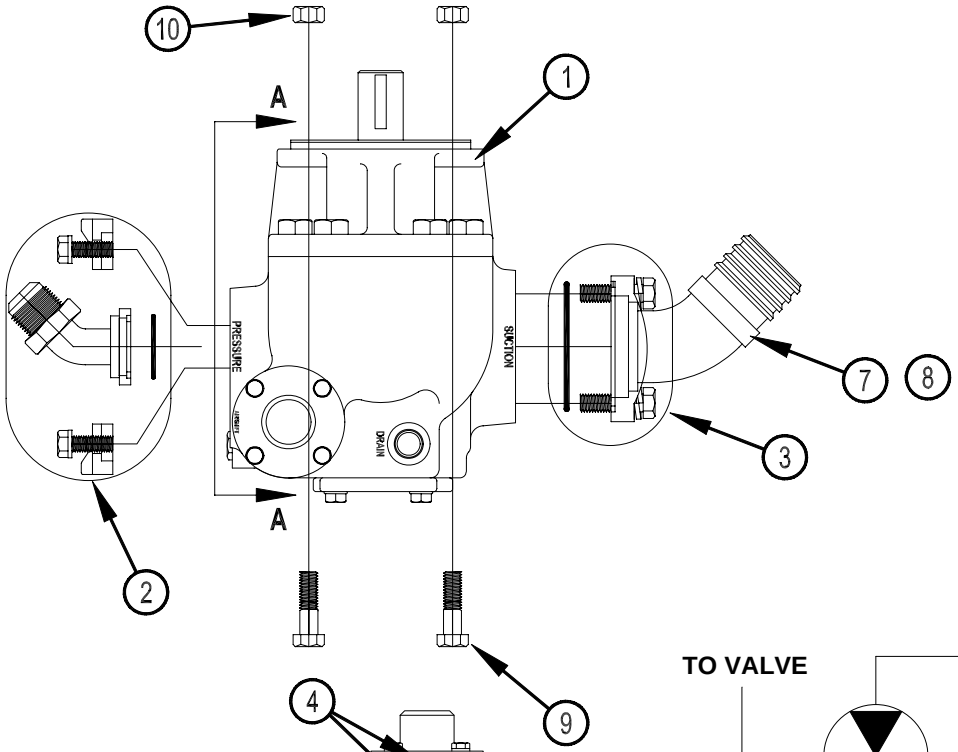
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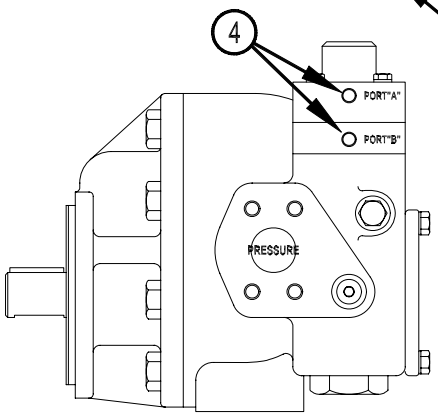
FRONT MOUNT HOSE KIT
272-8423

REF	PART NO.	DESCRIPTION	REQ'D
1	035-2727	GUARD, fiber	16ft
2	036-1295-007	CLAMP – 2-7/16"	12
3	036-1499	CLAMP, bandit	2
4	054-2988-005	ELBOW, 90°	1
5	054-3340-005	ELBOW, 90°	2
6	054-3341-005	CONNECTOR, straight	2
7	054-4194-002	ADAPTER	2
8	057-1719-003	END, pressure hose reuseable (shipper unit)	1
9	057-1719-010	FITTING, pressure hose	2
10	057-1719	HOSE, pressure (bulk)	16ft
11	057-2172	HOSE, suction – 2"	17ft
12	057-2223-001	HOSE, hydraulic with reuseable end	1
13	058-8579-006	FITTING, suction – 2"	1
14	074-4498-032	CLAMP, suction hose	4
15	211-9851	SUPPORT	8
16	QD2-FEFE-025	HOSE, hydraulic	1
17	FS070920	CAPSCREW – 3/8" – 16NC x 1"	14
18	FS230900	NUT, lock – 3/8" – 16NC	14

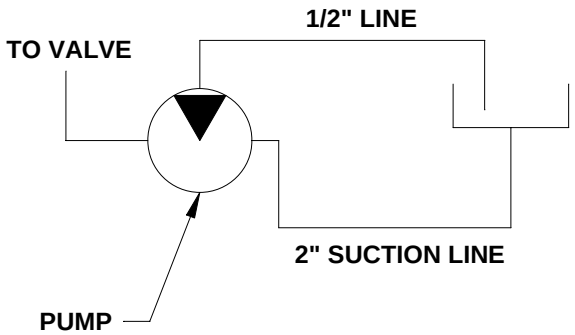
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FRONT MOUNT PUMP KIT
272-8466





VIEW A-A



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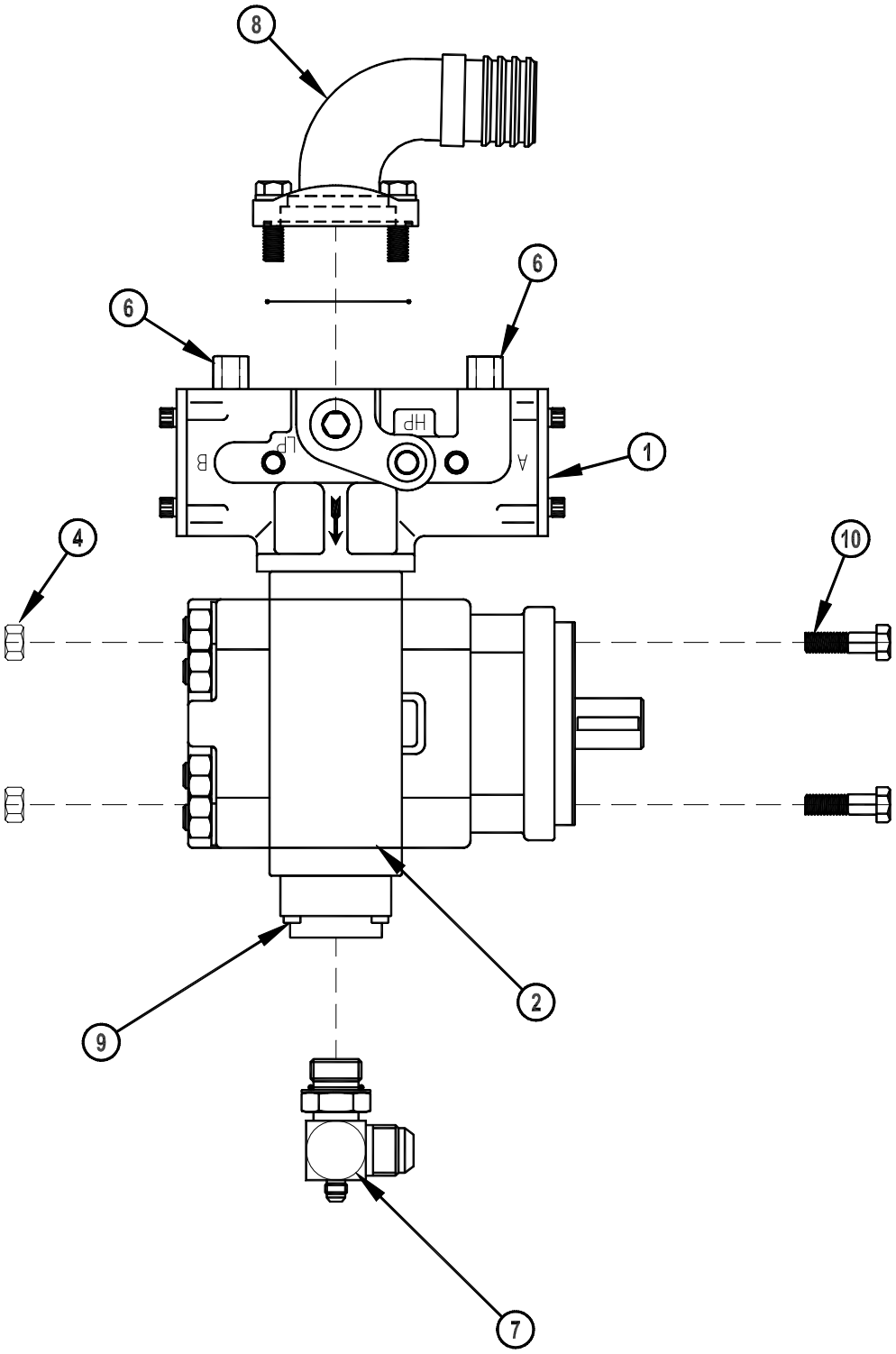
FORMULA 5000

FRONT MOUNT PUMP KIT
272-8466

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1995	PUMP, hydraulic (see section 5)	1
2	054-8722	FLANGE KIT, 45° split – 1-1/4"	1
	054-8722-001	ELBOW, 45°	1
	026-3932-020	O-RING	1
	054-8722-002	FLANG, halves	2
3	054-8736-006	FLANGE KIT, 4-bolt – 2"	1
	054-8736-036	FLANGE, halves	2
	054-9888-003	O-RING	1
	FS081144	CAPSCREW – 1/2" – 13NC x 3-1/2"	4
	FS541000	WASHER, lock – 1/2"	4
4	272-7973	AIR SHIFT KIT (see page 4.70)	1
6	272-8459	HOSE KIT, front mount (see page 4.58)	1
7	054-8667-001	FITTING, 45° suction flange	1
8	054-8668-001	FITTING, 90° suction flange	1
9	FS071126	CAPSCREW – 1/2" – 13NC x 1-3/4"	4
10	FS231100	NUT, lock – 1/2" – 13NC	4

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FRONT MOUNT PUMP KIT
372-2311



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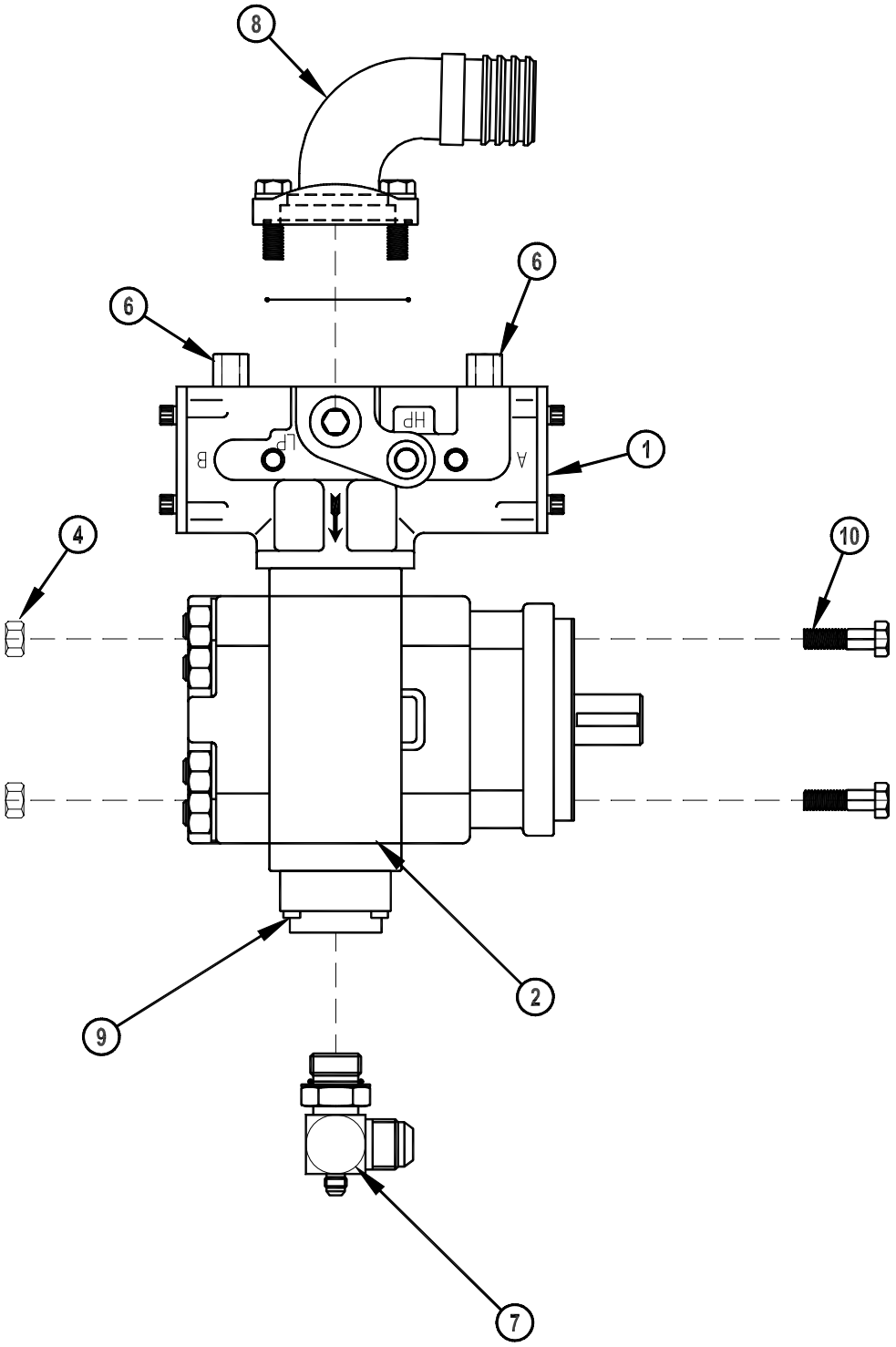
FORMULA 5000

FRONT MOUNT PUMP KIT
372-2311

REF	PART NO.	DESCRIPTION	REQ'D
1	031-3230	VALVE, dry (see section 5)	1
2	219-1473	PUMP, hydraulic (see section 5)	1
3	272-7973	AIR SHIFT KIT (see section 4.70)	1
4	FS231100	NUT, lock – 1/2" – 13NC	4
5	372-1774	HOSE KIT (see page 4.68.4)	1
6	054-4194-002	ADAPTER	2
7	054-8513	ELBOW, 90° - with 3/8" spud	1
8	074-4872	ELBOW, 90° SAE flange – 2-1/2 x 2"	1
	074-4487-002	HALF, flange	2
	054-8668-005	O-RING	1
	054-8668-006	CAPSCREW – 1/2" – 13NC x 1-1/4"	4
	054-8668-009	WASHER, lock – 1/2"	4
9	074-4496	FLANGE, O-RING	1
10	FS071126	CAPSCREW – 1/2" – 13NC x 1-3/4"	4

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FRONT MOUNT PUMP KIT for MACK CHASSIS
372-1841



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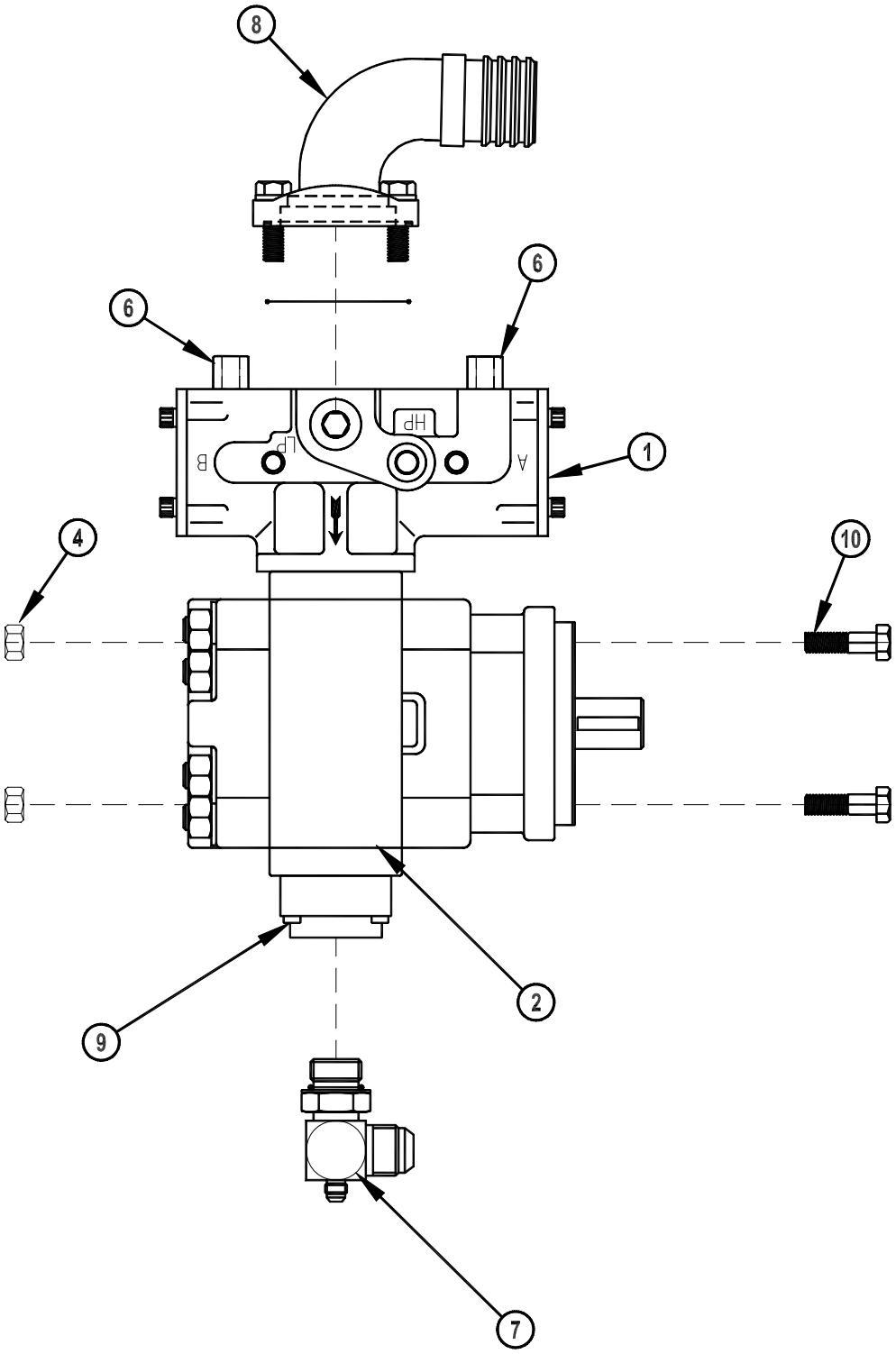
FORMULA 5000

FRONT MOUNT PUMP KIT for MACK CHASSIS
372-1841

REF	PART NO.	DESCRIPTION	REQ'D
1	031-3230	VALVE, dry (see section 5)	1
2	219-2231	PUMP, hydraulic (see section 5)	1
3	272-7973	AIR SHIFT KIT (see section 4.70)	1
4	FS231100	NUT, lock – 1/2" – 13NC	4
5	372-1760	HOSE KIT (see page 4.68.6)	1
6	054-4194-002	ADAPTER	2
7	054-8513	ELBOW, 90° - with 3/8" spud	1
8	074-4872	ELBOW, 90° SAE flange – 2-1/2 x 2"	1
	074-4487-002	HALF, flange	2
	054-8668-005	O-RING	1
	054-8668-006	CAPSCREW – 1/2" – 13NC x 1-1/4"	4
	054-8668-009	WASHER, lock – 1/2"	4
9	074-4458	FLANGE, O-RING	1
10	FS071126	CAPSCREW – 1/2" – 13NC x 1-3/4"	4

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FRONT MOUNT PUMP KIT
372-1225



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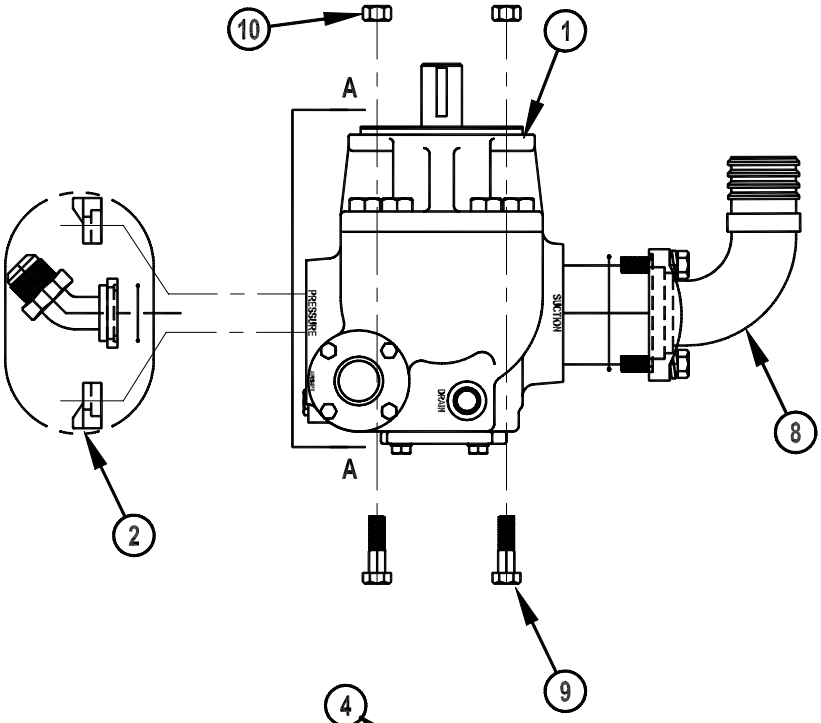
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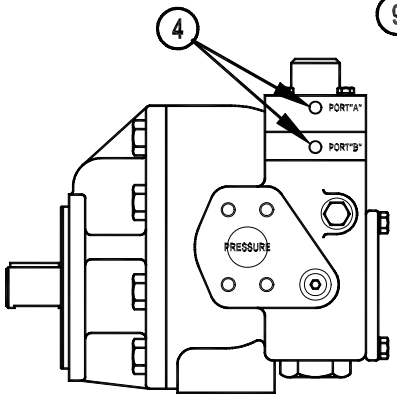
FRONT MOUNT PUMP KIT
372-1225

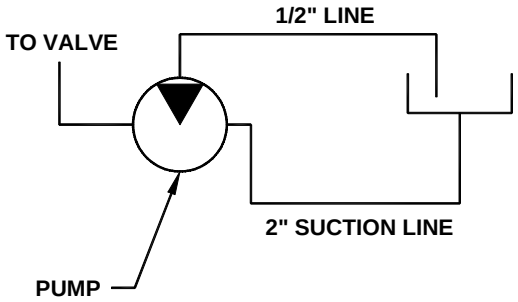
REF	PART NO.	DESCRIPTION	REQ'D
1	031-3230	VALVE, dry (see section 5)	1
2	219-2224	PUMP, hydraulic (see section 5)	1
3	272-7973	AIR SHIFT KIT (see section 4.70)	1
4	FS231100	NUT, lock – 1/2" – 13NC	4
5	372-1774	HOSE KIT (see page 4.68.4)	1
6	054-4194-002	ADAPTER	2
7	054-8513	ELBOW, 90° - with 3/8" spud	1
8	074-4872	ELBOW, 90° SAE flange – 2-1/2 x 2"	1
	074-4487-002	HALF, flange	2
	054-8668-005	O-RING	1
	054-8668-006	CAPSCREW – 1/2" – 13NC x 1-1/4"	4
	054-8668-009	WASHER, lock – 1/2"	4
9	074-4458	FLANGE, O-RING	1
10	FS071126	CAPSCREW – 1/2" – 13NC x 1-3/4"	4

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FRONT MOUNT PUMP KIT
372-1571







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FORMULA 5000

FRONT MOUNT PUMP KIT
372-1571

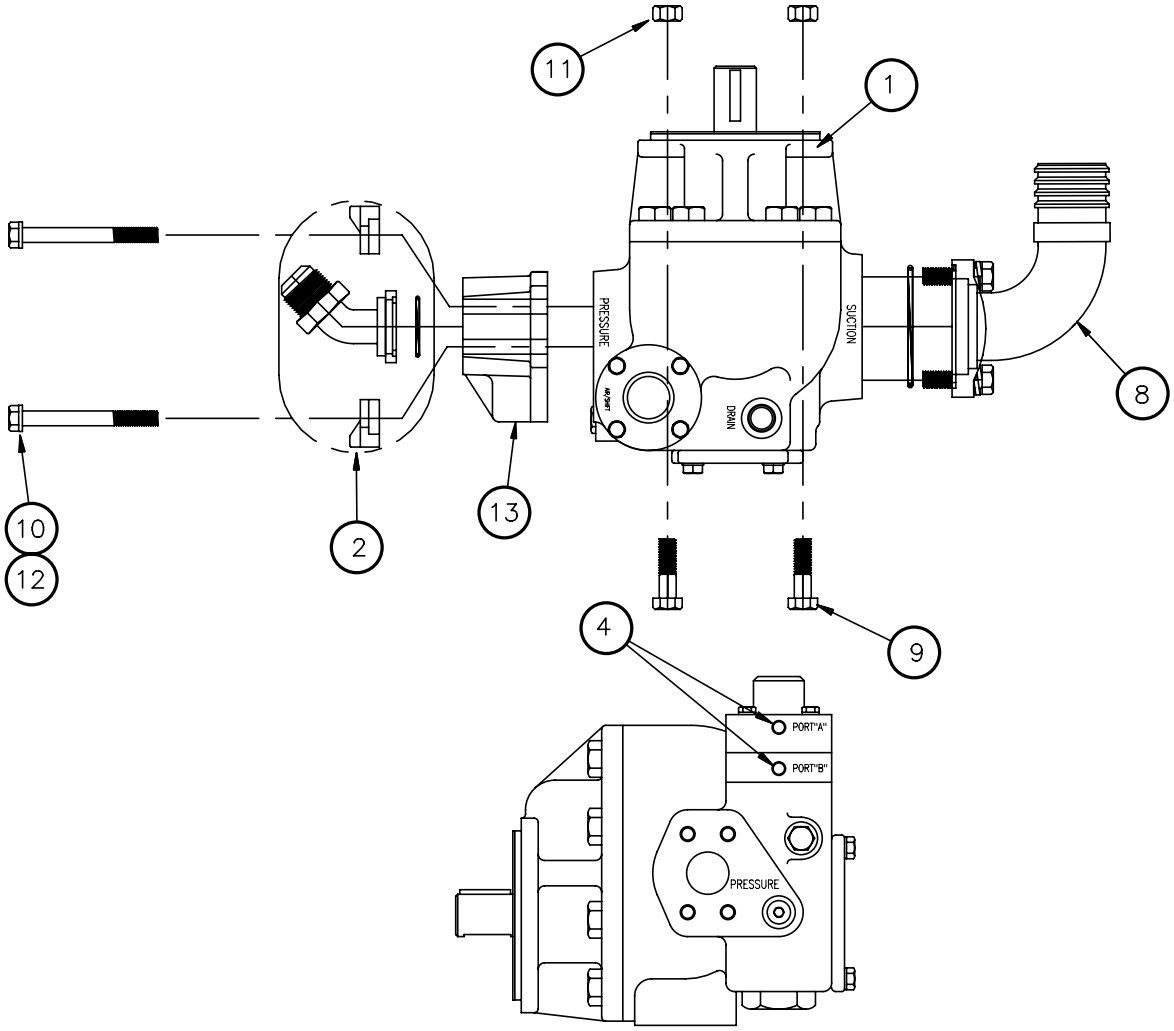
REF	PART NO.	DESCRIPTION	REQ'D
1	219-1894	PUMP, hydraulic (see section 5)	1
2	054-8722	FLANGE KIT, 45° split	1
	054-8722-001	ELBOW, 45°	1
	026-3932-020	O-RING	1
	054-8722-002	FLANGE, halves	2
3	074-4872	ELBOW, 90° SAE flange – 2-1/2 x 2"	1
	074-4487-002	HALF, flange	2
	054-8668-005	O-RING	1
	054-8668-006	CAPSCREW – 1/2" – 13NC x 1-1/4"	4
	054-8668-009	WASHER, lock – 1/2"	4
4	272-7973	AIR SHIFT KIT (see page 4.70)	1
5	FS231100	NUT, lock – 1/2" – 13NC	4
6	FS071126	CAPSCREW – 1/2" – 13NC x 1-3/4"	4
7	372-1836	HOSE KIT (see page 4.68.2)	1
8	272-7738	OVERSPEED KIT (see section 3)	1

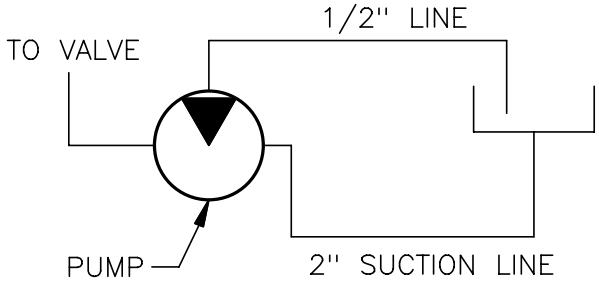
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FRONT MOUNT PUMP KIT
372-1598





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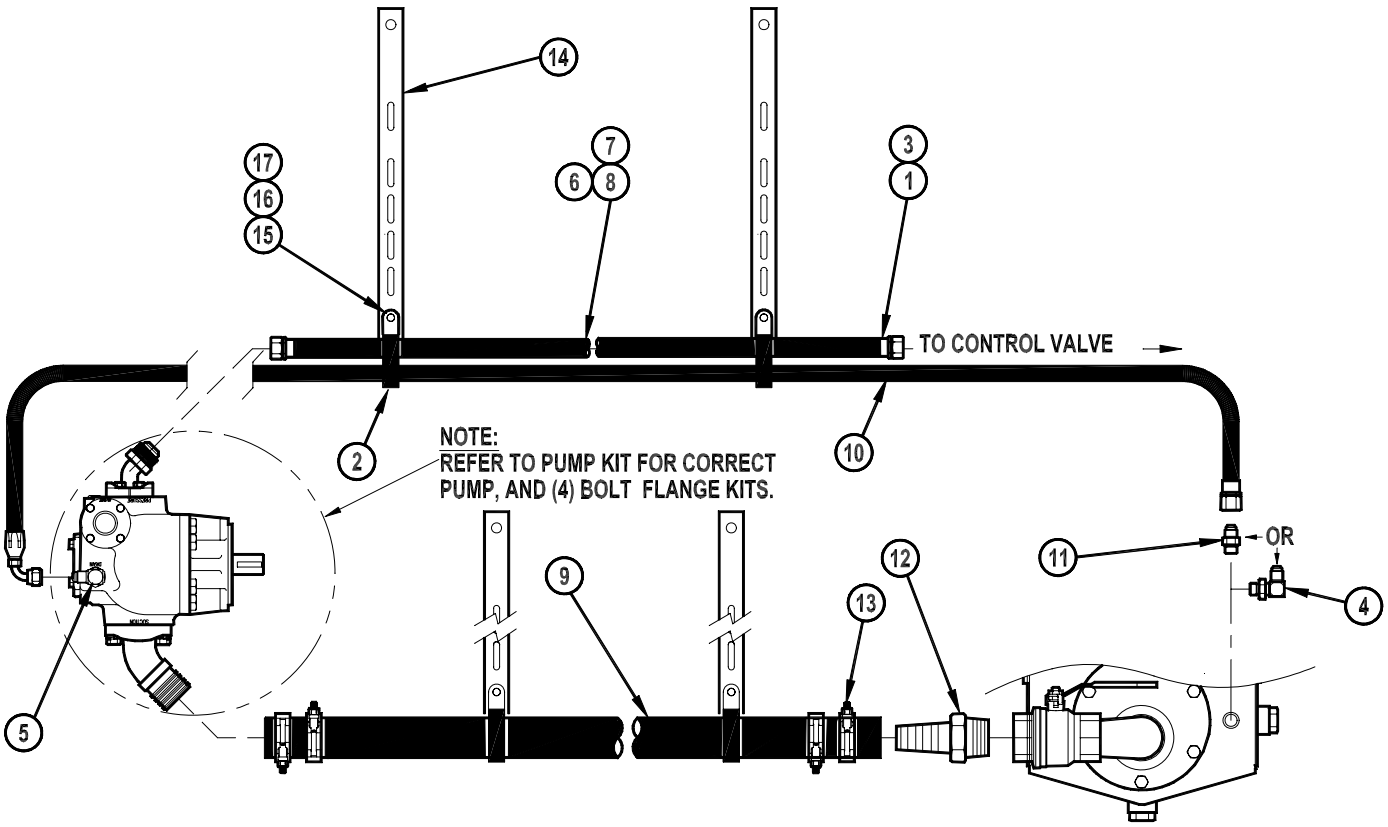
FORMULA 5000

FRONT MOUNT PUMP KIT
372-1598

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1894	PUMP, hydraulic (see section 5)	1
2	054-8722	FLANGE KIT, 45° split	1
	054-8722-001	ELBOW, 45°	1
	026-3932-020	O-RING	1
	054-8722-002	FLANGE, halves	2
4	272-7973	AIR SHIFT KIT (see page 4.70)	1
5	372-1836	HOSE KIT (see page 4.68.2)	1
8	074-4872	ELBOW, 90° SAE flange – 2-1/2 x 2"	1
	074-4487-002	HALF, flange	2
	054-8668-005	O-RING	1
	054-8668-006	CAPSCREW – 1/2" – 13NC x 1-1/4"	4
	054-8668-009	WASHER, lock – 1/2"	4
9	FS071126	CAPSCREW – 1/2" – 13NC x 1-3/4"	4
10	FS081050	CAPSCREW – 7/16" – 14 x 4"	4
11	FS231100	NUT, lock – 1/2" – 13NC	4
12	FS551000	WASHER, lock – 7/16"	4
13	031-5801-050	VALVE, flow control	1
14	272-7738	OVERSPEED KIT (see section 3)	1
5			

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FRONT MOUNT PUMP HOSE KIT
372-1836



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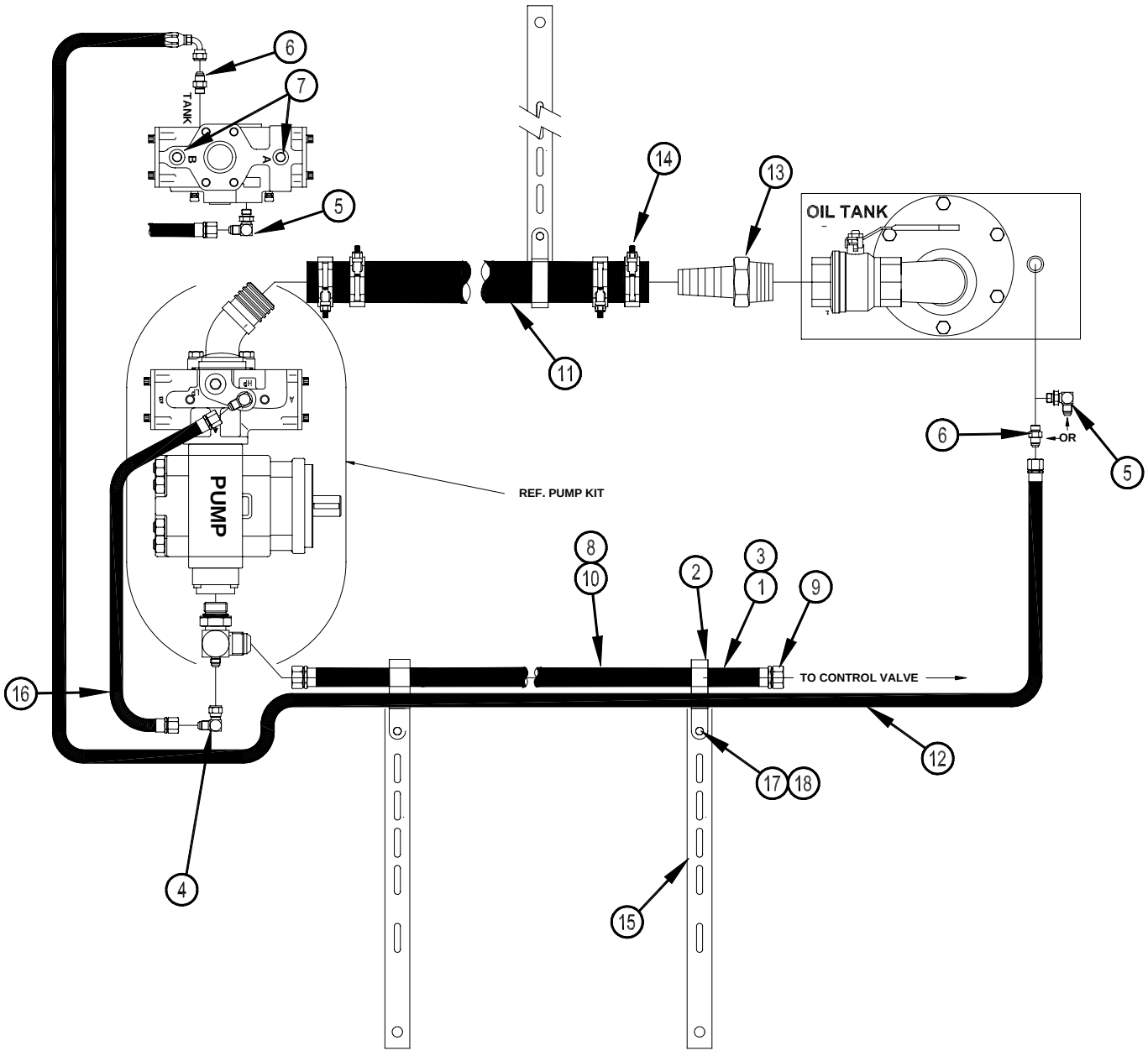
FORMULA 5000

FRONT MOUNT PUMP HOSE KIT
372-1836

REF	PART NO.	DESCRIPTION	REQ'D
1	035-2727	GUARD, fiber	17ft
2	036-1295-007	CLAMP – 2-7/16"	10
3	036-1499	CLAMP, bandit	2
4	054-3237-018	ELBOW, 90° reducing	1
5	054-3340-006	ELBOW, 90° male	1
6	FS520900	WASHER, flat – 3/8"	20
7	057-1719-010	FITTING, pressure hose	2
8	057-1719	HOSE, hydraulic – pressure	17ft
9	057-2232	HOSE, suction – 2-1/2"	17ft
10	057-2248-001	HOSE, hydraulic – with reuseable end – 1/2"	1
11	058-3205-022	REDUCER – 3/8" x 1/2"	1
12	058-8579-007	FITTING, suction hose	1
13	074-4498-040	CLAMP, suction hose	4
14	211-9851	BRACKET, hose support	6
15	FS070920	CAPSCREW – 3/8" – 16NC x 1"	10
16	FS230900	NUT, lock – 3/8" – 16NC	20

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FRONT MOUNT HOSE KIT
372-1774



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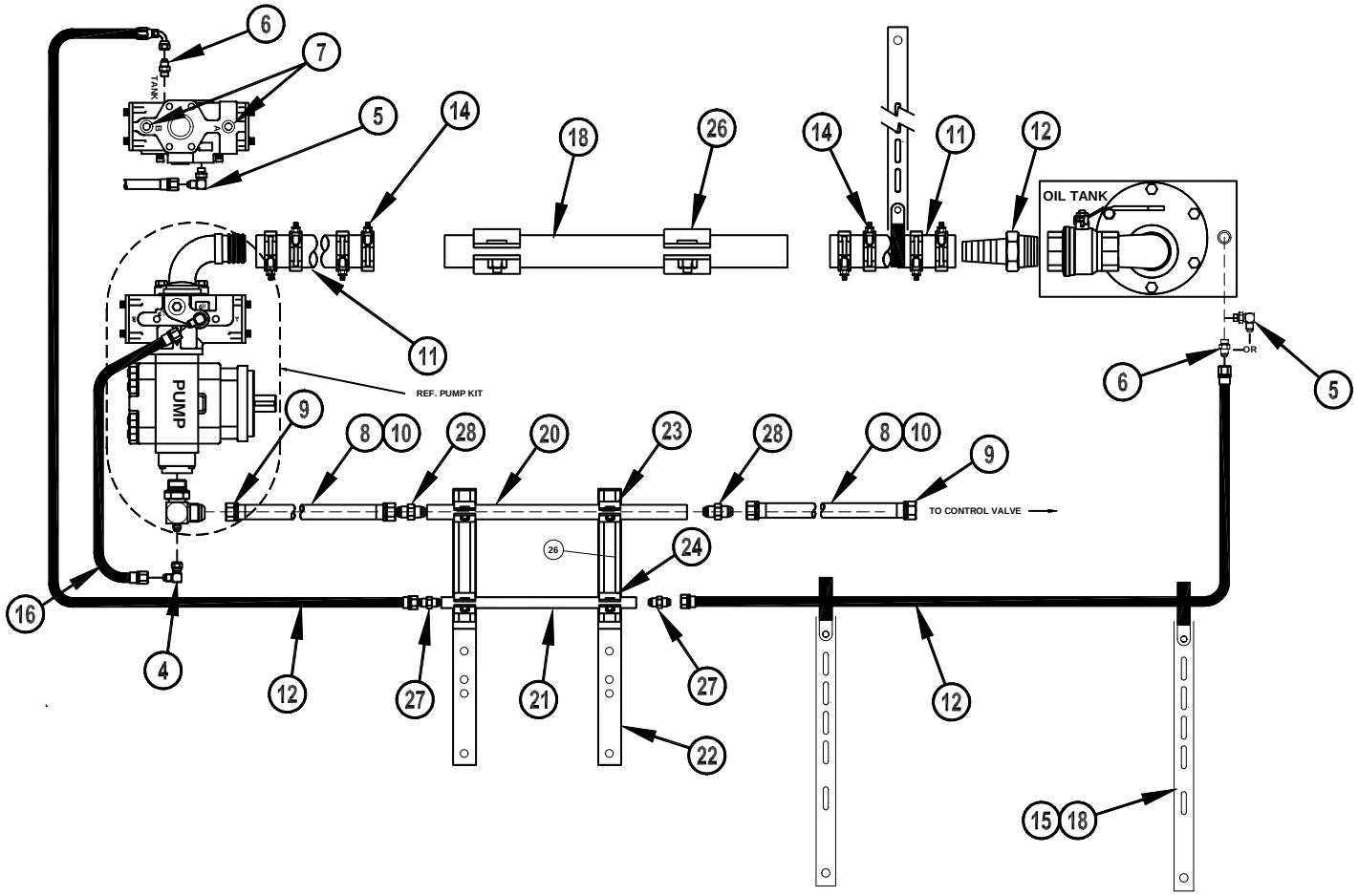
FORMULA 5000

FRONT MOUNT HOSE KIT
372-1774

REF	PART NO.	DESCRIPTION	REQ'D
1	035-2727	GUARD, fiber	16ft
2	036-1295-007	CLAMP – 2-7/16"	12
3	036-1499	CLAMP, bandit	2
4	054-2988-005	ELBOW, 90°	1
5	054-3340-005	ELBOW, 90°	2
6	054-3341-005	CONNECTOR, straight	2
7	054-4194-002	ADAPTER	2
8	057-1719-003	END, pressure hose reuseable (shipper unit)	1
9	057-1719-010	FITTING, pressure hose	2
10	057-1719	HOSE, pressure (bulk)	16ft
11	057-2232	HOSE, suction – 2"	17ft
12	057-2223-001	HOSE, hydraulic with reuseable end	1
13	058-8579-007	FITTING, suction – 2"	1
14	074-4498-040	CLAMP, suction hose	4
15	211-9851	SUPPORT	8
16	QD2-FEFE-025	HOSE, hydraulic	1
17	FS070920	CAPSCREW – 3/8" – 16NC x 1"	14
18	FS230900	NUT, lock – 3/8" – 16NC	14

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HOSE KIT for FRONT MOUNT PUMP – MACK CHASSIS
372-1760



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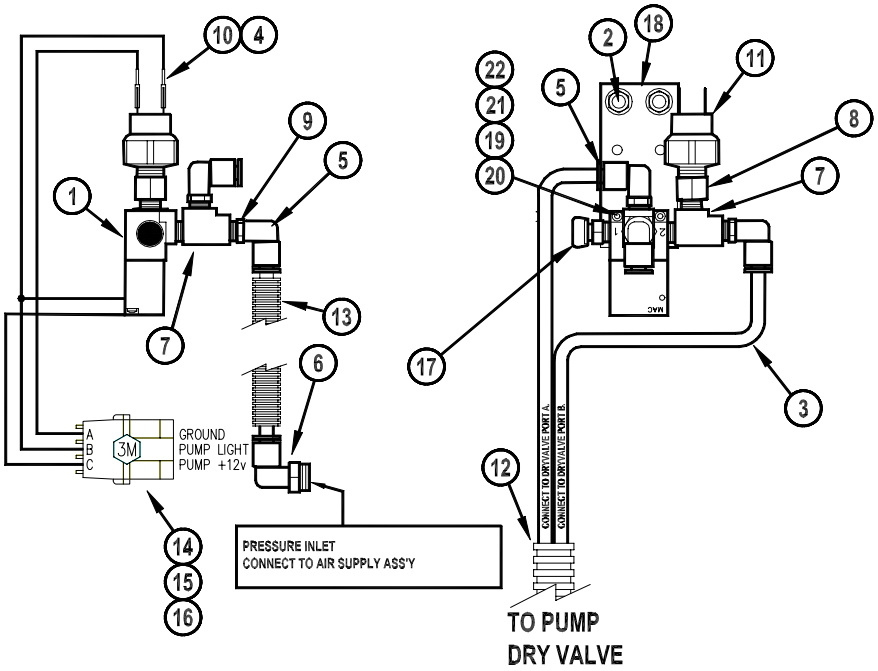
FORMULA 5000

HOSE KIT for FRONT MOUNT PUMP – MACK CHASSIS
372-1760

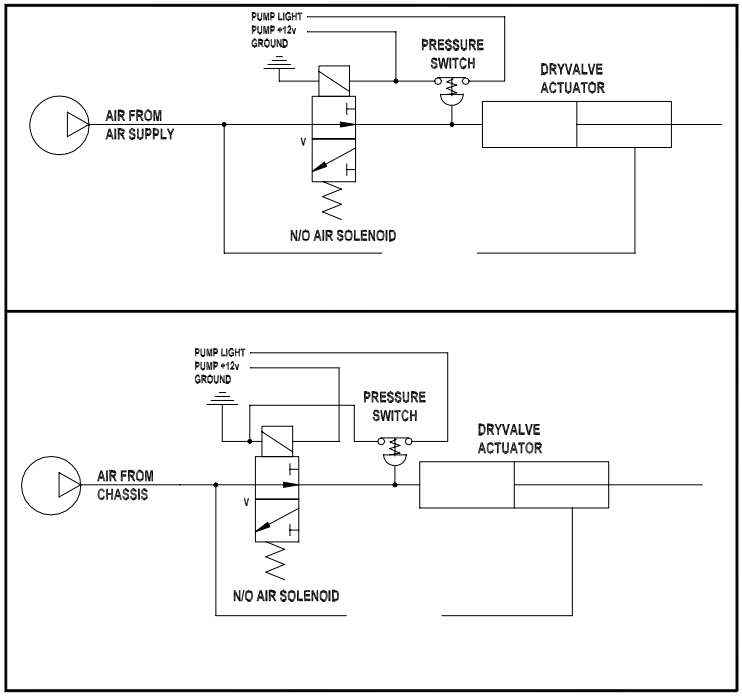
REF	PART NO.	DESCRIPTION	REQ'D
1	035-2727	GUARD, fiber	16ft
2	036-1295-007	CLAMP – 2-7/16"	12
3	036-1499	CLAMP, bandit	2
4	054-2988-005	ELBOW, 90°	1
5	054-3340-005	ELBOW, 90°	2
6	054-3341-005	CONNECTOR, straight	2
7	054-4194-002	ADAPTER	2
8	057-1719-003	END, pressure hose reuseable (shipper unit)	1
9	057-1719-010	FITTING, pressure hose	2
10	057-1719	HOSE, pressure (bulk)	16ft
11	057-2232	HOSE, suction – 2-1/2"	17ft
12	057-2223-002	HOSE, hydraulic with reuseable end	1
13	058-8579-007	FITTING, suction – 2"	1
14	074-4498-040	CLAMP, suction hose	4
15	211-9851	SUPPORT	8
16	QD2-FEFE-025	HOSE, hydraulic	1
17	FS070920	CAPSCREW – 3/8" – 16NC x 1"	14
18	FS230900	NUT, lock – 3/8" – 16NC	14
19	354-2350	TUBE, suction	1
20	354-2351	TUBE, pressure	1
21	354-2352	TUBE, return to tank	1
22	311-1099	BRACKET, clamp	2
23	036-1474-008	CLAMP, tube – 1"	2
24	036-1474-004	CLAMP, tube – 1/2"	2
25	036-1474-014	CLAMP, tube – 2-1/2"	2
26	207-2938-008	CHANNEL, tube clamp	2
27	054-3007-006	CONNECTOR, straight	2
28	054-3007-008	CONNECTOR, straight	2

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PUMP AIR SHIFT KIT
272-7973



ELECTRICAL/PNEUMATIC DIGRAM



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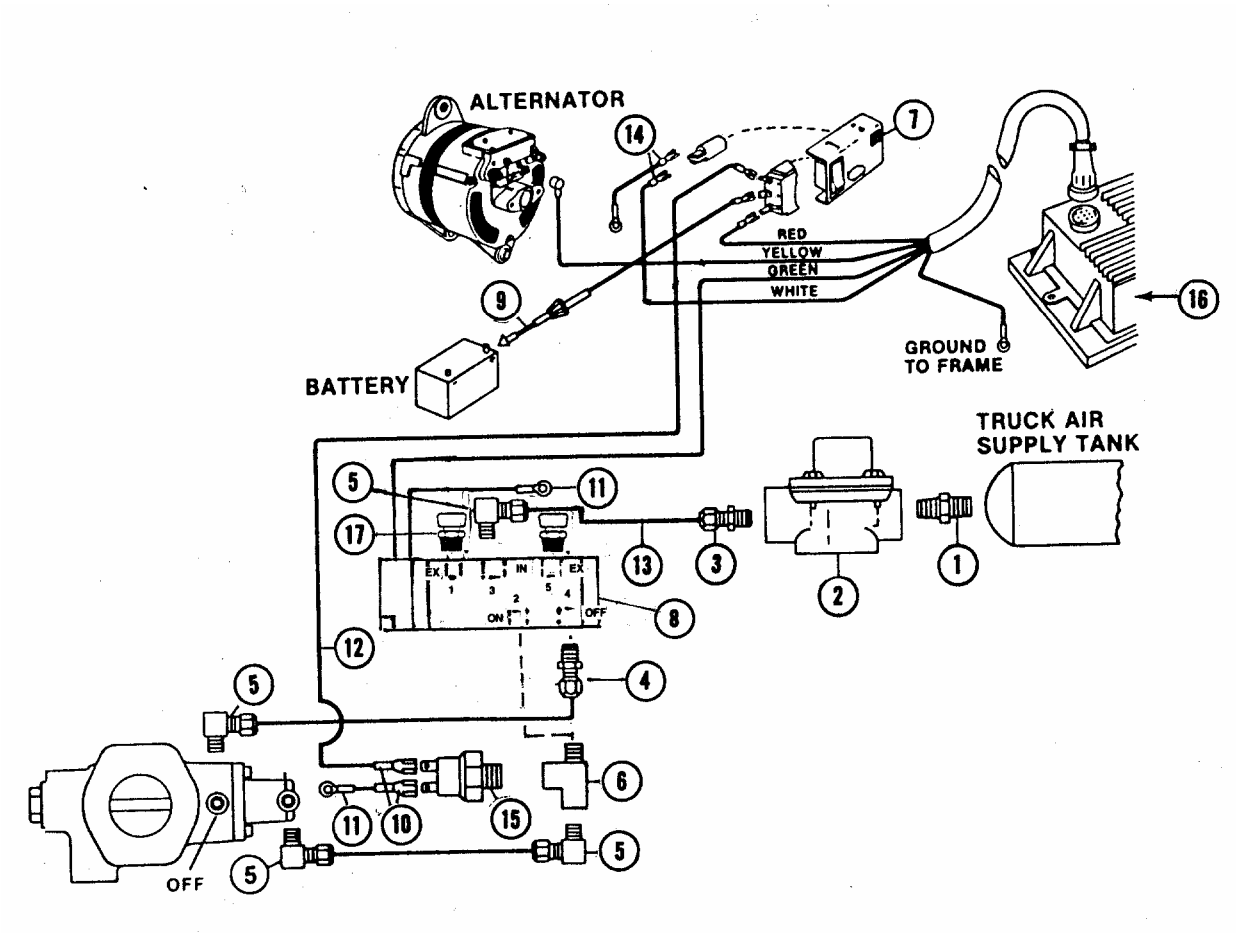
FORMULA 5000

PUMP AIR SHIFT KIT
272-7973

REF	PART NO.	DESCRIPTION	REQ'D
1	031-5724-012	VALVE, solenoid	1
2	047-2151-001	TEK SCREW – 1/4"	2
3	054-5449	LINE, air – 1/4"	36ft
4	054-7350	TUBING, shrink	2"
5	054-8470-003	ELBOW, 90° reducing – 1/8" x 1/4"	2
6	054-8470-004	ELBOW, 90° - 1/4" x 1/4"	3
7	054-8470-001	TEE	1
8	054-8881-003	FITTING, reducer	1
9	054-8927-003	NIPPLLE, pipe – 1/4" cx 1/8"	1
10	108-0880	TERMINAL, quick disconnect	2
11	108-4176-006	SWITCH, pressure	1
12	108-4476	LOOM, electrical	12ft
13	108-4498	LOOM, electrical	12ft
14	108-4827-005	CONNECTOR, 3-way male	1
15	108-4827-011	TERMINAL, male	3
16	108-4827-013	SEAL, cable	3
17	108-5354-006	VENT, breather	1
18	211-5744	BRACKET, throttle solenoid	1
19	FS270300	NUT, hex - #8 – 32	2
20	FS420320	SCREW, machine - #8 – 32 x 1-1/2"	2
21	FS510300	WASHER, flat - #8	2
22	FS550300	WASHER, lock - #8	2

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ELECTRIC/AIR SHIFT KIT with OVERSPEED
108-5354



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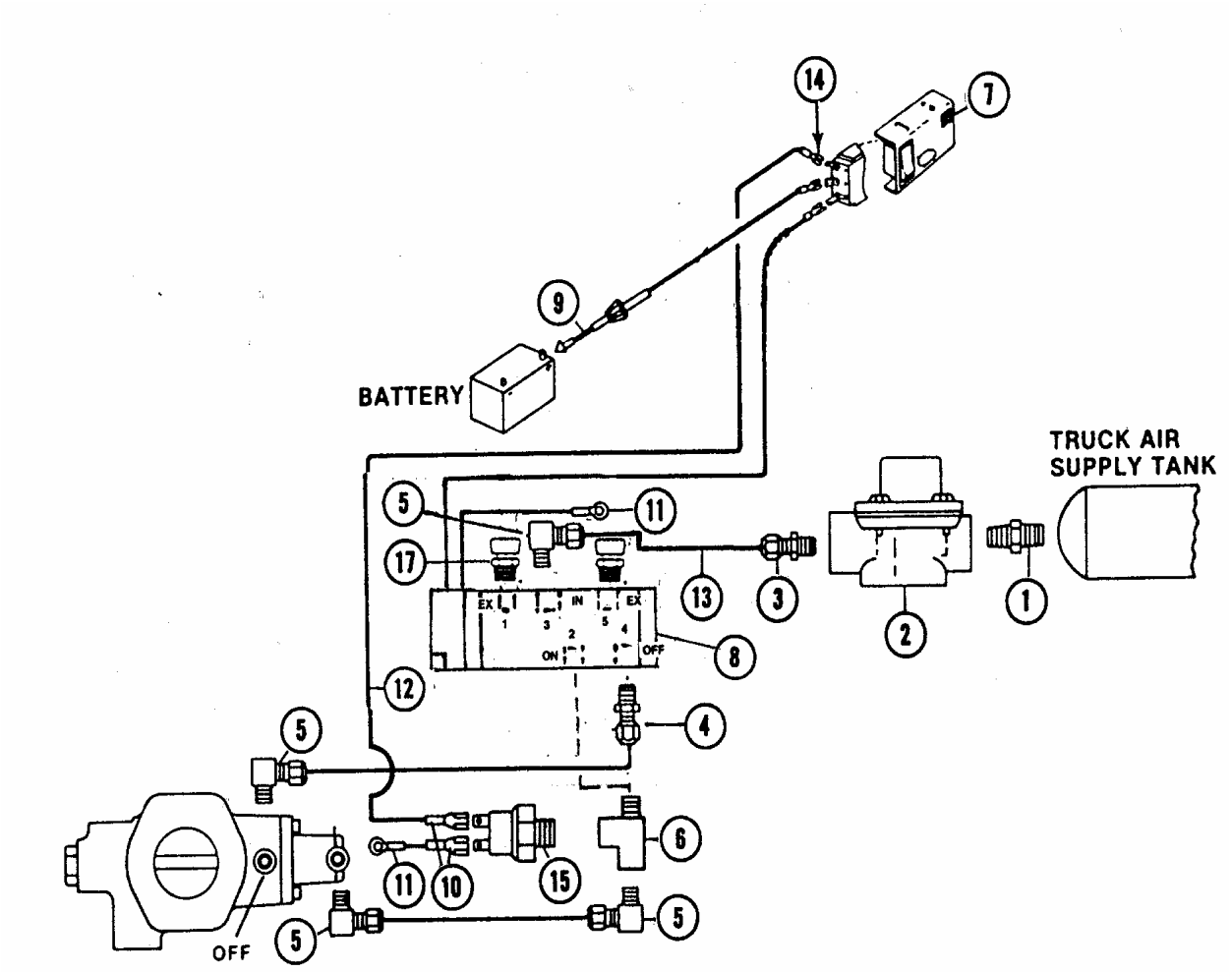
FORMULA 5000

ELECTRIC/AIR SHIFT KIT with OVERSPEED
108-5354

REF	PART NO.	DESCRIPTION	REQ'D
1	108-4176-011	NIPPLE	1
2	108-4176-010	VALVE, pressure protection	1
3	108-5354-001	FITTING, tube	1
4	108-5354-002	FITTING, tube	1
5	108-4176-013	ELBOW, fitting	4
6	108-4176-005	TEE	1
7	108-4176-012	SWITCH & LIGHT ASSEMBLY	1
8	108-5354-003	VALVE, solenoid	1
9	108-4176-014	HOLDER, fuse	1
10	108-4176-007	CLIP, terminal	2
11	108-4176-008	TERMINAL, ring	2
12	108-5354-004	WIRE	1
13	108-4176-010	TUBING, air	30ft
14	108-4176-013	CONNECTOR, female spade	5
15	108-5354-005	SWITCH, pressure	1
16	108-4545	SWITCH, electronic overspeed	1
17	108-5354-006	BREATHER	2

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ELECTRIC/AIR SHIFT KIT without OVERSPEED
108-5355



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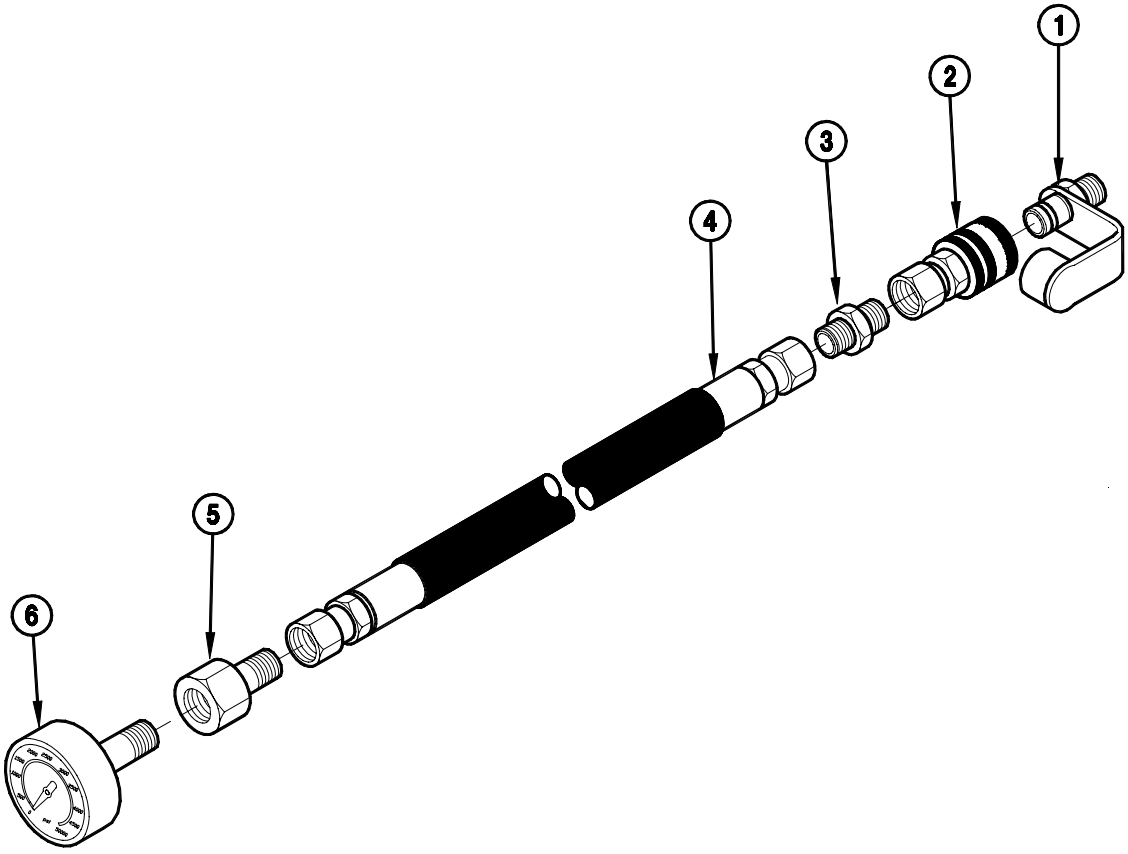
FORMULA 5000

ELECTRIC/AIR SHIFT KIT without OVERSPEED
108-5355

REF	PART NO.	DESCRIPTION	REQ'D
1	108-4176-011	NIPPLE	1
2	108-4176-010	VALVE, pressure protection	1
3	108-5354-001	FITTING, tube	1
4	108-5354-002	FITTING, tube	1
5	108-4176-013	ELBOW, fitting	4
6	108-4176-005	TEE	1
7	108-4176-012	SWITCH & LIGHT ASSEMBLY	1
8	108-5354-003	VALVE, solenoid	1
9	108-4176-014	HOLDER, fuse	1
10	108-4176-007	CLIP, terminal	2
11	108-4176-008	TERMINAL, ring	2
12	108-5354-004	WIRE	1
13	108-4176-010	TUBING, air	30ft
14	108-4176-013	CONNECTOR, female spade	5
15	108-5354-005	SWITCH, pressure	1
16	108-5354-006	BREATHER	2

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PRESSURE TEST GAUGE KIT
272-6347



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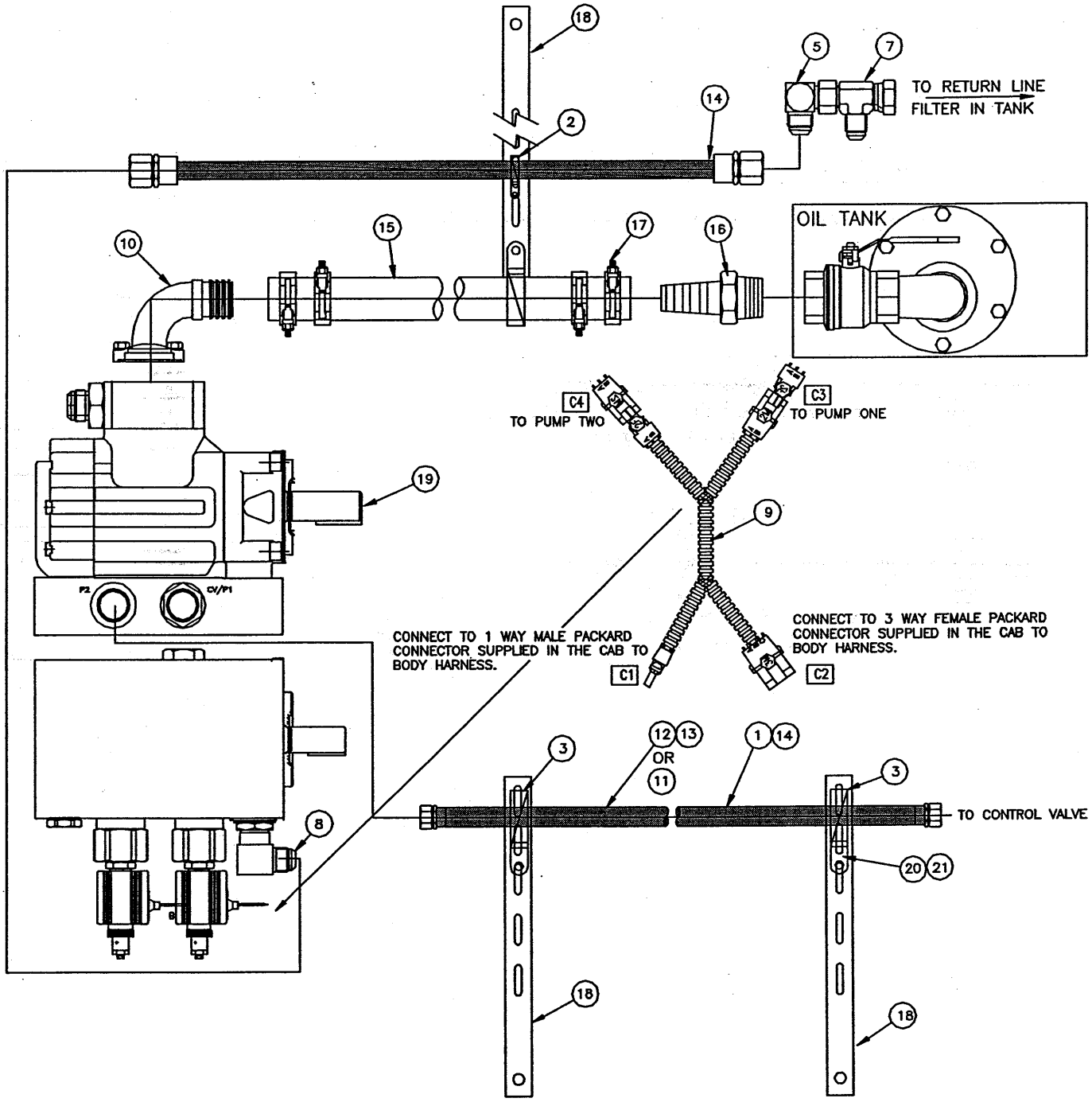
FORMULA 5000

PRESSURE TEST GAUGE KIT
272-6347

REF	PART NO.	DESCRIPTION	REQ'D
1	031-5601-003	DISCONNECT, quick – male	1
2	031-5601-002	DISCONNECT, quick – female	1
3	054-3526-004	CONNECTOR	1
4	QZ1-FCFC-017	HOSE, hydraulic	1
5	054-3532-014	CONNECTOR	1
6	067-0640	GAUGE, pressure – 0-5000 PSI	1

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FRONT MOUNT TANDEM PUMP INSTALLATION
372-2906

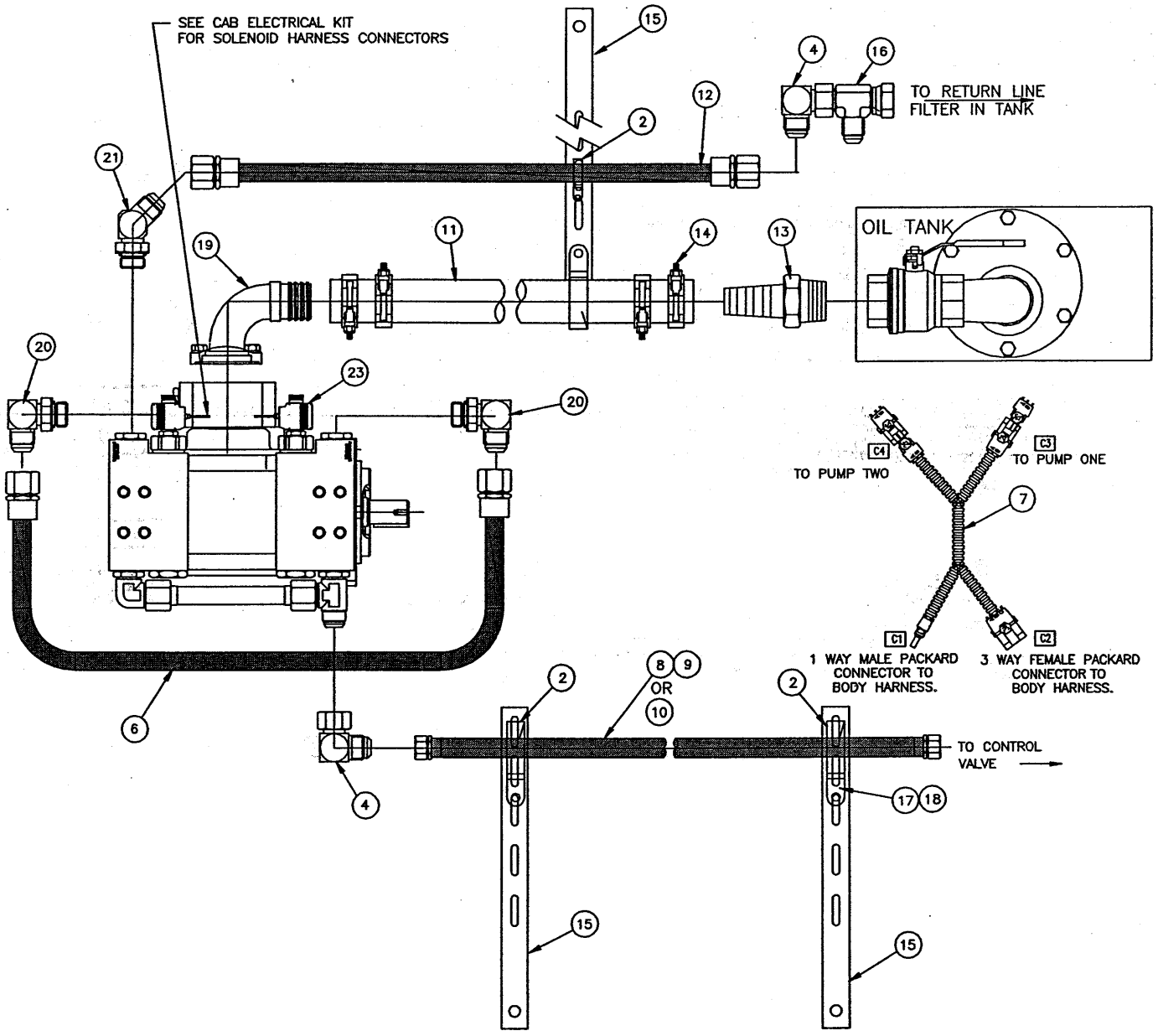


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FRONT MOUNT TANDEM PUMP INSTALLATION
372-2906

REF	PART NO.	DESCRIPTION	REQ'D
1	035-2727	GUARD, fiber	16 ft.
2	036-1122-018	CLAMP, hose – 1-1/8"	6
3	036-1122-033	CLAMP, hose – 2-7/16"	6
4	036-1499	CLAMP, bandit	2
5	054-2988-010	ELBOW, 90° - 1"	2
6	054-3005-010	ELBOW, 45° - 1"	1
7	054-3624-010	TEE	1
8	054-3340-010	ELBOW, 90°	1
9	263-1381	HARNESS, pump adapter	1
10	354-0366	FLANGE KIT, 90° suction	1
	354-0366-001	ELBOW, 90°	1
	354-0366-002	FLANGE, split	1
11	057-1719-002	END, reuseable hose – 1" (for shipper units only)	1
12	057-1719-010	FITTING, pressure hose – 1"	2
13	057-1719	HOSE, hydraulic –1" (bulk)	20 ft.
14	057-2194-120	HOSE, hydraulic – w/reuseable end	1
15	057-2232	HOSE, suction – 2"	17 ft.
16	058-8579-006	FITTING, suction hose	1
17	074-4498-032	CLAMP, suction hose – 2-1/2"	4
18	211-9851	SUPPORT, hose	8
19	219-2288	PUMP, hydraulic	1
21	FS070920	CAPSCREW – 3/8" – 16NC x 1"	14
22	FS230900	NUT, lock – 3/8" – 16NC	14
23	372-2966	KIT, pressure switch hose	1

FRONT MOUNT TANDEM PUMP INSTALLATION
372-2247

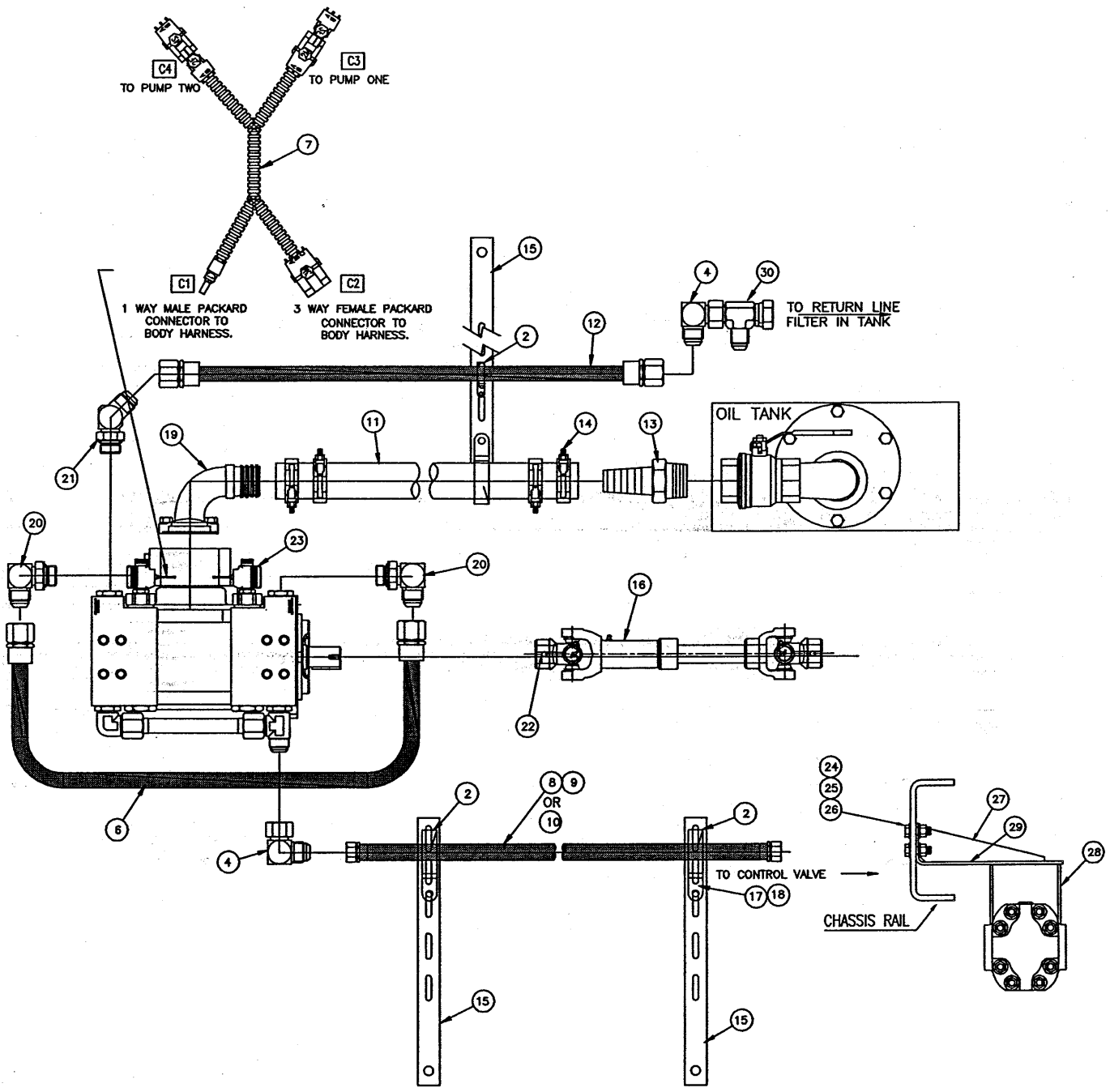


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FRONT MOUNT TANDEM PUMP INSTALLATION
372-2247

REF	PART NO.	DESCRIPTION	REQ'D
1	035-2727	GUARD, fiber	16 ft.
2	036-1295-007	CLAMP, hose – 2-7/16"	12
3	036-1499	CLAMP, bandit	2
4	054-2988-010	ELBOW, 90° - 1"	2
6	057-2194-036	HOSE, hydraulic – w/reuseable end	1
7	263-1381	HARNESS, pump adapter	1
8	057-1719-002	END, reuseable hose – 1" (for shipper units only)	1
9	057-1719-010	FITTING, pressure hose – 1"	2
10	057-1719	HOSE, hydraulic –1" (bulk)	20 ft.
11	057-2232	HOSE, suction – 2"	17 ft.
12	057-2194-120	HOSE, hydraulic – w/reuseable end	1
13	058-8579-007	FITTING, suction hose	1
14	074-4498-040	CLAMP, suction hose – 2-1/2"	4
15	211-9851	SUPPORT, hose	8
16	054-3624-010	TEE	1
17	FS070920	CAPSCREW – 3/8" – 16NC x 1"	14
18	FS230900	NUT, lock – 3/8" – 16NC	14
19	074-4872	FLANGE KIT, 90° suction	1
	074-4487-009	ELBOW, 90°	1
	054-8668-002	HALVES, flange	2
	054-8668-005	O-RING	1
	054-8668-006	CAPSCREW – 1/2" – 13NC x 1-1/4"	4
	054-8668-009	NUT, lock – 1/2" – 13NC	4
20	054-3340-010	ELBOW, 90°	3
21	054-3005-010	ELBOW, 45° - 1"	1
22	372-2966	KIT, pressure switch hose	1
23	219-2269	PUMP, hydraulic	1

PTO MOUNT TANDEM PUMP INSTALLATION
372-2268



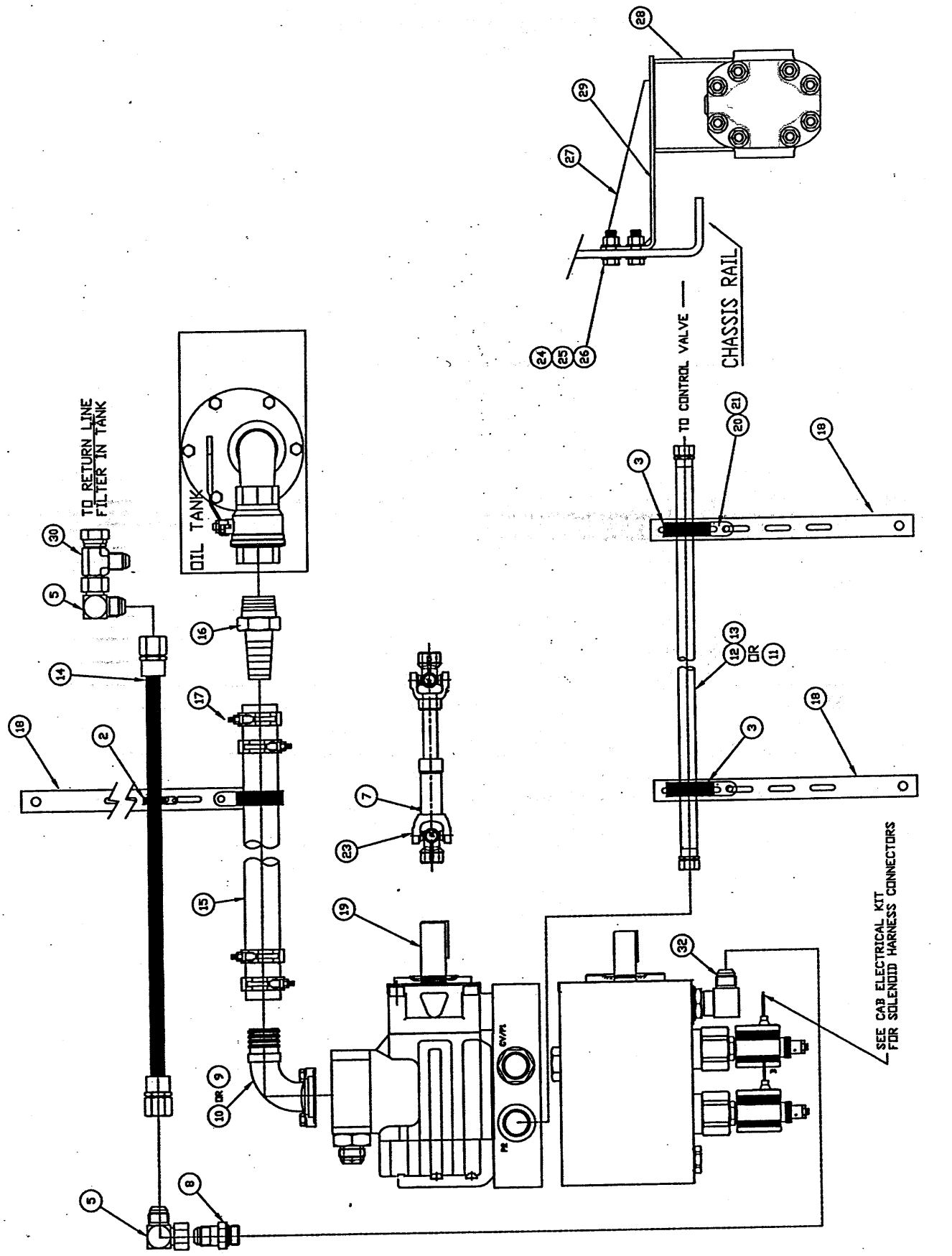
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PTO MOUNT TANDEM PUMP INSTALLATION
372-2268

REF	PART NO.	DESCRIPTION	REQ'D
1	035-2727	GUARD, fiber	16 ft.
2	036-1295-007	CLAMP, hose – 2-7/16"	6
3	036-1499	CLAMP, bandit	2
4	054-2988-010	ELBOW, 90° - 1"	2
5	372-2966	KIT, pressure switch hose	1
6	057-2194-036	HOSE, hydraulic – w/reuseable end	1
7	263-1381	HARNESS, pump adapter	1
8	057-1719-002	END, reuseable hose – 1" (for shipper units only)	1
9	057-1719-010	FITTING, pressure hose – 1"	2
10	057-1719	HOSE, hydraulic –1" (bulk)	10 ft.
11	057-2232	HOSE, suction – 2"	8 ft.
12	057-2194-120	HOSE, hydraulic – w/reuseable end	1
13	058-8579-006	FITTING, suction hose	1
14	074-4498-032	CLAMP, suction hose – 2-1/2"	4
15	211-9851	SUPPORT, hose	8
16	030-0850-026	DRIVE LINE ASSEMBLY	1
17	FS070920	CAPSCREW – 3/8" – 16NC x 1"	14
18	FS230900	NUT, lock – 3/8" – 16NC	14
19	074-4872	FLANGE KIT, 90° suction	1
	074-4487-009	ELBOW, 90°	1
	054-8668-002	HALVES, flange	2
	054-8668-005	O-RING	1
	054-8668-006	CAPSCREW – 1/2" – 13NC x 1-1/4"	4
	054-8668-009	NUT, lock – 1/2" – 13NC	4
20	054-3340-010	ELBOW, 90°	3
21	054-3005-010	ELBOW, 45° - 1"	1
22	263-0042	WIRE, lock	2
23	219-2271	PUMP, hydraulic	1
24	055-1391-007	WASHER, hardened – 5/8"	8
25	FS071330	CAPSCREW – 5/8" – 11NC x 2"	4
26	FS231300	NUT, lock – 5/8" – 11NC	4
27	011-4049-002	GUSSET	1
28	311-3482	SUPPORT, pump bracket	1
29	311-0913	BRACKET, pump mounting	1
30	054-3624-010	TEE	1

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PTO MOUNT TANDEM PUMP INSTALLATION
372-2936



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PTO MOUNT TANDEM PUMP INSTALLATION
372-2936

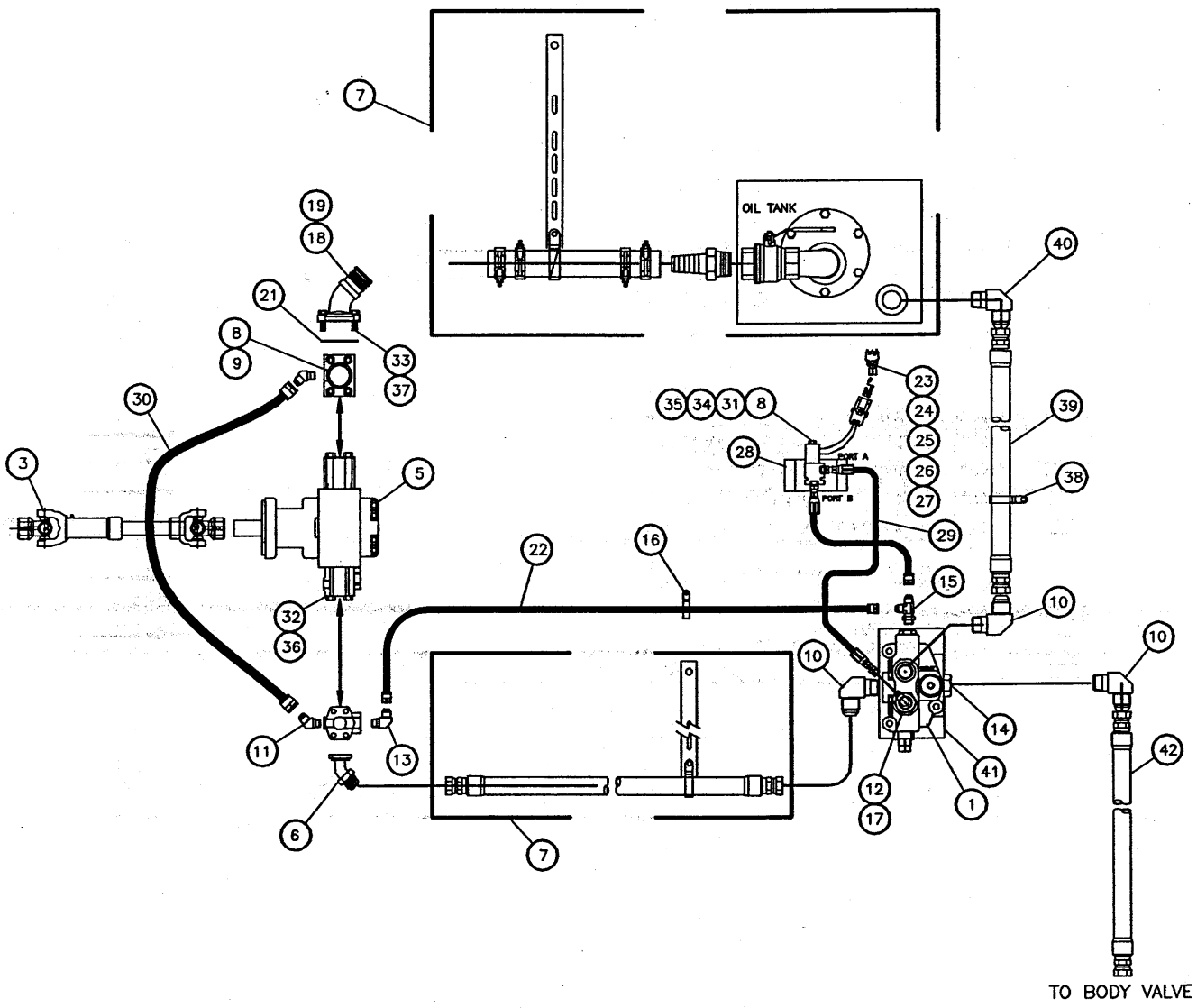
REF	PART NO.	DESCRIPTION	REQ'D
1	035-2727	GUARD, fiber	20 ft.
2	036-1122-018	CLAMP, hose – 1-1/8"	6
3	036-1122-033	CLAMP, hose – 2-7/16"	6
4	036-1499	CLAMP, bandit	2
5	054-2988-010	ELBOW, 90° - 1"	2
6	054-3005-010	ELBOW, 45° - 1"	1
7	030-0850-026	DRIVE LINE ASSEMBLY	1
8	054-3341-010	CONNECTOR, straight	1
9	054-8667	FLANGE KIT, 45° suction	1
	054-8667-001	ELBOW, 45°	1
	054-8668-002	HALVES, flange	2
	054-8668-003	HALF, clamp	1
	054-8668-004	HALF, clamp	1
	054-8668-005	O-RING	1
	054-8668-006	CAPSCREW – 1/2" – 13NC x 1-1/4"	4
	054-8668-009	NUT, lock – 1/2" – 13NC	4
10	054-8668	FLANGE KIT, 90° suction	1
	054-8668-001	ELBOW, 90°	1
	054-8668-002	HALVES, flange	2
	054-8668-003	HALF, clamp	1
	054-8668-004	HALF, clamp	1
	054-8668-005	O-RING	1
	054-8668-006	CAPSCREW – 1/2" – 13NC x 1-1/4"	4
	054-8668-009	NUT, lock – 1/2" – 13NC	4
11	057-1719-002	END, reuseable hose – 1" (for shipper units only)	1
12	057-1719-010	FITTING, pressure hose – 1"	2
13	057-1719	HOSE, hydraulic –1" (bulk)	20 ft.
14	057-2194-120	HOSE, hydraulic – w/reuseable end	1
15	057-2232	HOSE, suction – 2"	17 ft.
16	058-8579-006	FITTING, suction hose	1
17	074-4498-032	CLAMP, suction hose – 2-1/2"	4
18	211-9851	SUPPORT, hose	8
19	219-2289	PUMP, hydraulic	1
21	FS070920	CAPSCREW – 3/8" – 16NC x 1"	14
22	FS230900	NUT, lock – 3/8" – 16NC	14
23	263-0042	WIRE, lock	2
24	055-1391-007	WASHER, hardened – 5/8"	8
25	FS071330	CAPSCREW – 5/8" – 11NC x 2"	4
26	FS231300	NUT, lock – 5/8" – 11NC	4
27	011-4049-002	GUSSET	1
28	311-3482	SUPPORT, pump bracket	1
29	311-0913	BRACKET, pump mounting	1
30	054-3624-010	TEE	1
31	372-2966	KIT, pressure switch hose	1
32	054-3340-010	ELBOW, 90°	1
33	263-1381	HARNESS, pump adapter	1

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HOC FRONT MOUNT PUMP KIT
372-2645



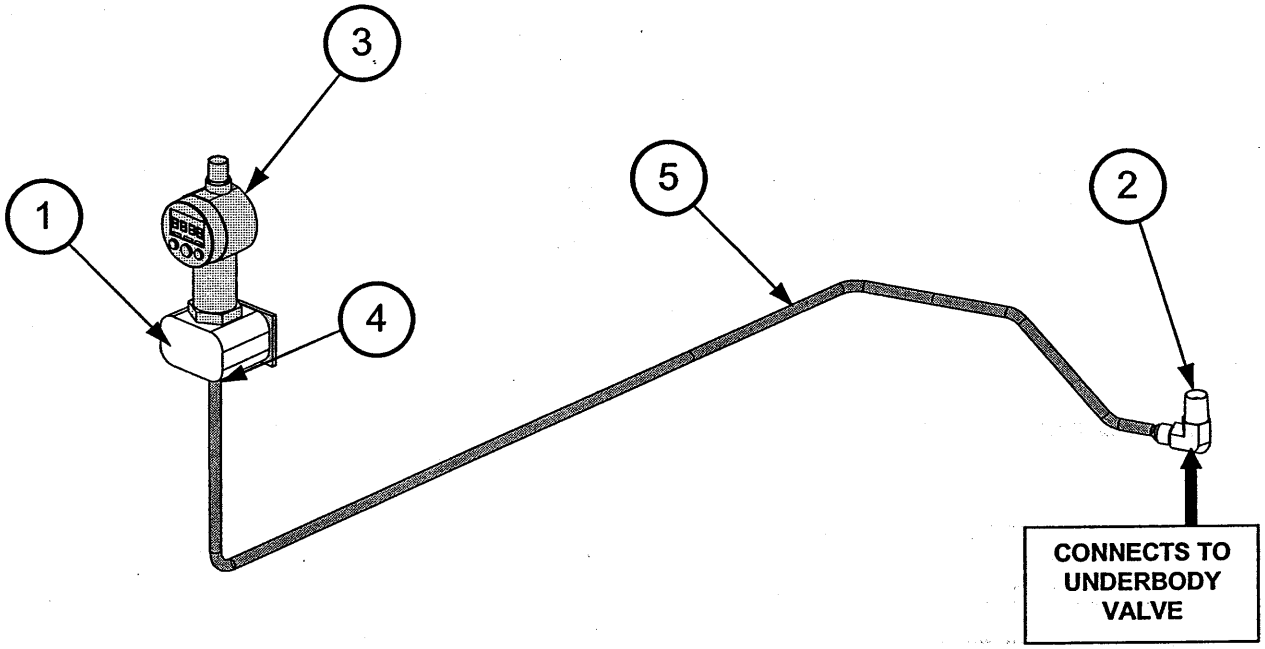
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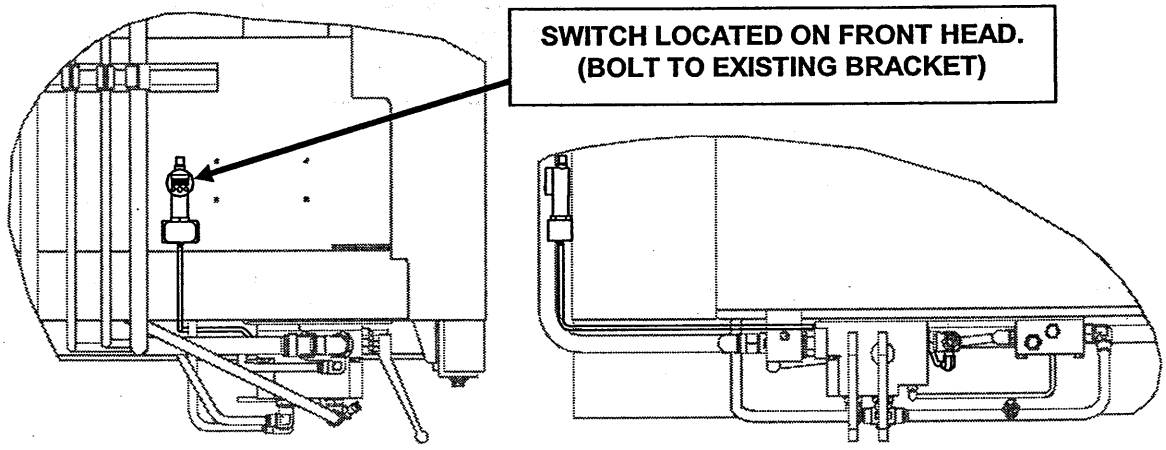
HOC FRONT MOUNT PUMP KIT
372-2645

REF	PART NO.	DESCRIPTION	REQ'D
1	031-6068	VAVLE, inlet-outlet	1
2	031-5776-001	VALVE, flow control – (55 gpm)	1
3	030-0705	DRIVELINE	1
4	031-5796	VALVE, directional control	1
5	219-1910	PUMP, hydraulic	1
6	054-8722	FLANGE KIT, 4-bolt – 1-1/4"	1
	FS071022	CAPSCREW – 7/16" – 14NC x 1-1/4"	4
	FS551000	WASHER, lock – 7/16"	4
	026-3932-020	O-RING	1
	054-8722-001	ELBOW, 45° 4-bolt flange	1
	054-8722-002	HALVES, flange	2
7	272-8023	HOSE KIT (see std. manual – section 4)	1
8	026-3932-032	O-RING	1
9	031-5777	BLOCK, inlet	1
10	054-3237-001	ELBOW, 90° reducing	3
11	054-3005-008	ELBOW, 45°	2
12	054-3237-017	ELBOW, 90° reducing	1
13	054-3340-006	ADAPTER, 90°	1
14	054-3342-006	PLUG, pipe – 1-1/4" SAE	1
15	054-3343-006	TEE – 1/2"	1
16	036-1295-005	CLAMP	3
17	054-3609-012	BUSHING, reducing – 1-1/4" x 3/4"	1
18	054-8667-001	ELBOW, 45° flange (used on most chassis)	1
19	054-8668-001	ELBOW, 90° flange (on Volvo chassis)	1
20	054-8668-002	FLANGE, half	2
21	054-8668-005	O-RING	1
22	057-2236-200	HOSE, hydraulic	1
23	108-4827-003	CONNECTOR	1
24	108-4827-004	CONNECTOR	1
25	108-4827-002	TERMINAL, female	2
26	108-4827-013	SEAL, cable	4
27	108-4827-111	TERMINAL, male	2
28	211-7297	BRACKET, valve mounting	1
29	QD3-FFGF-036	HOSE, hydraulic	2
30	QV5-FHFH-025	HOSE, hydraulic	1
31	FS070726	CAPSCREW – 1/4" – 20NC x 1-3/4"	2
32	FS081050	CAPSCREW – 7/16" – 14NC x 4"	4
33	FS081144	CAPSCREW – 1/2" – 13NC x 3-1/2"	4
34	FS230700	NUT, lock – 1/4" – 20NC	4
35	FS510750	WASHER, flat – 1/4"	4
36	FS551000	WASHER, lock – 7/16"	4
37	FS551100	WASHER, lock – 1/2"	4
38	036-1295-007	CLAMP	1
39	057-2194-140	HOSE, hydraulic 1" return	1
40	054-3340-010	ELBOW, 90°	2
41	311-1523	BRACKET, valve	1
42	057-1719	HOSE, pressure	1

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PRESSURE SWITCH KIT
372-2966





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PRESSURE SWITCH KIT
372-2966

REF	PART NO.	DESCRIPTION	REQ'D
1	036-1597-006	CLAMP, tube – 1"	1
2	054-3667-002	ADAPTER - 1/4" x 1/4"	1
3	063-0114	SWITCH, pressure	1
4	354-2522	ADAPTER	1
5	354-2785	TUBE, hydraulic – pressure	1

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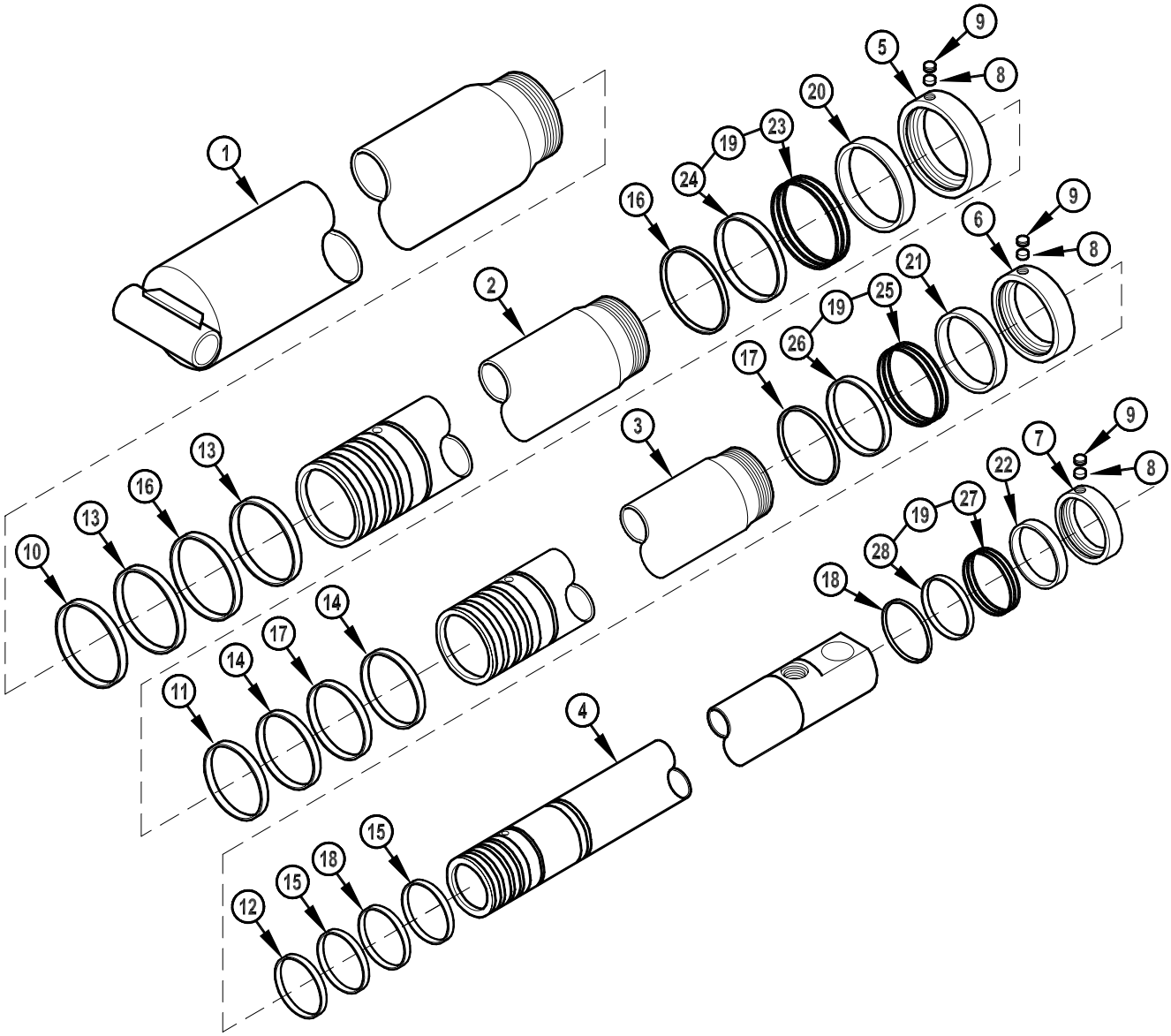
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Ejector (001-6464) 5.5
Ejector (001-6427) 5.7
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EJECTOR CYLINDER for 18 CU. YD. UNITS
001-6463



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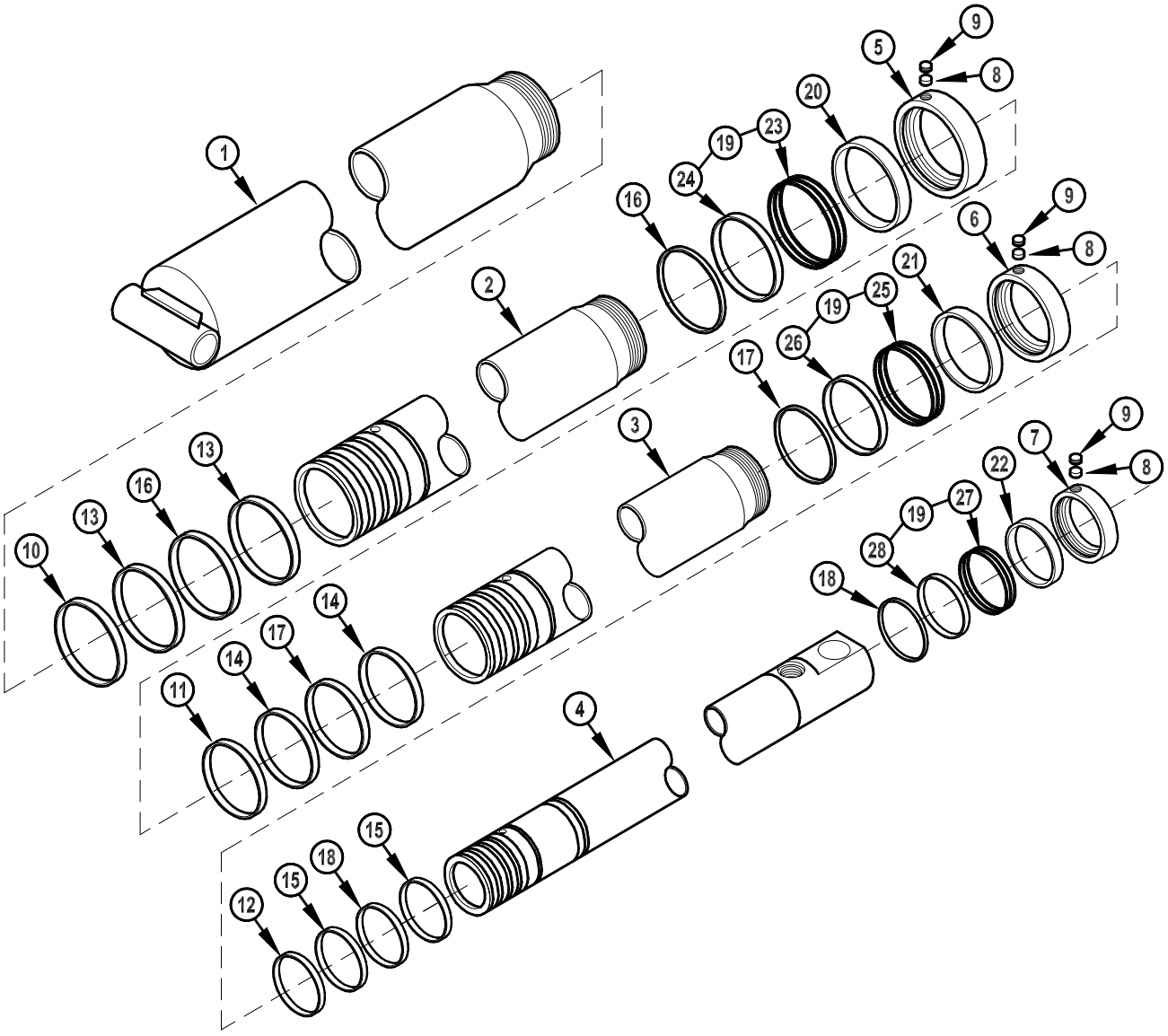
EJECTOR CYLINDER for 18 CU. YD. UNITS
001-6463

REF	PART NO.	DESCRIPTION	REQ'D
1	001-6463-001	BARREL ASSEMBLY	1
2	001-6463-002	SLEEVE ASSEMBLY – 5"	1
3	001-6463-003	SLEEVE ASSEMBLY – 4"	1
4	001-6463-004	PLUNGER ASSEMBLY – 3"	1
5	001-6421-009	GLAND, retaining	1
6	001-6421-010	GLAND, retaining	1
7	001-6421-011	GLAND, retaining	1
8	NSS	SLUG, nylon	4
9	001-3689-021	SETSCREW	4
10	NSS	RING, wear	2
11	NSS	RING, wear	2
12	NSS	RING, wear	2
13	NSS	RING, piston	2
14	NSS	RING, piston	2
15	NSS	RING, piston	2
16	001-4881-022	RING, retaining – internal	1
17	001-4881-025	RING, retaining – internal	1
18	001-4881-020	RING, retaining – internal	1
19	001-3742-003	KIT, build – packing - (consists of items 23 thru 28)	1
20	NSS	RING, guide – top	1
21	NSS	RING, guide – top	1
22	NSS	RING, guide – top	1
23	NSS	PACKING SET (see item 19)	1
24	NSS	WIPER (see item 19)	1
25	NSS	PACKING SET (see item 19)	1
26	NSS	WIPER (see item 19)	1
27	NSS	PACKING SET (see item 19)	1
28	NSS	WIPER (see item 19)	1

-	272-4881	KIT, cylinder rebuild (consists of items 8, 10 thru 15 & 19 thru 22)	A/R

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EJECTOR CYLINDER for 20 CU. YD. UNITS
001-6464



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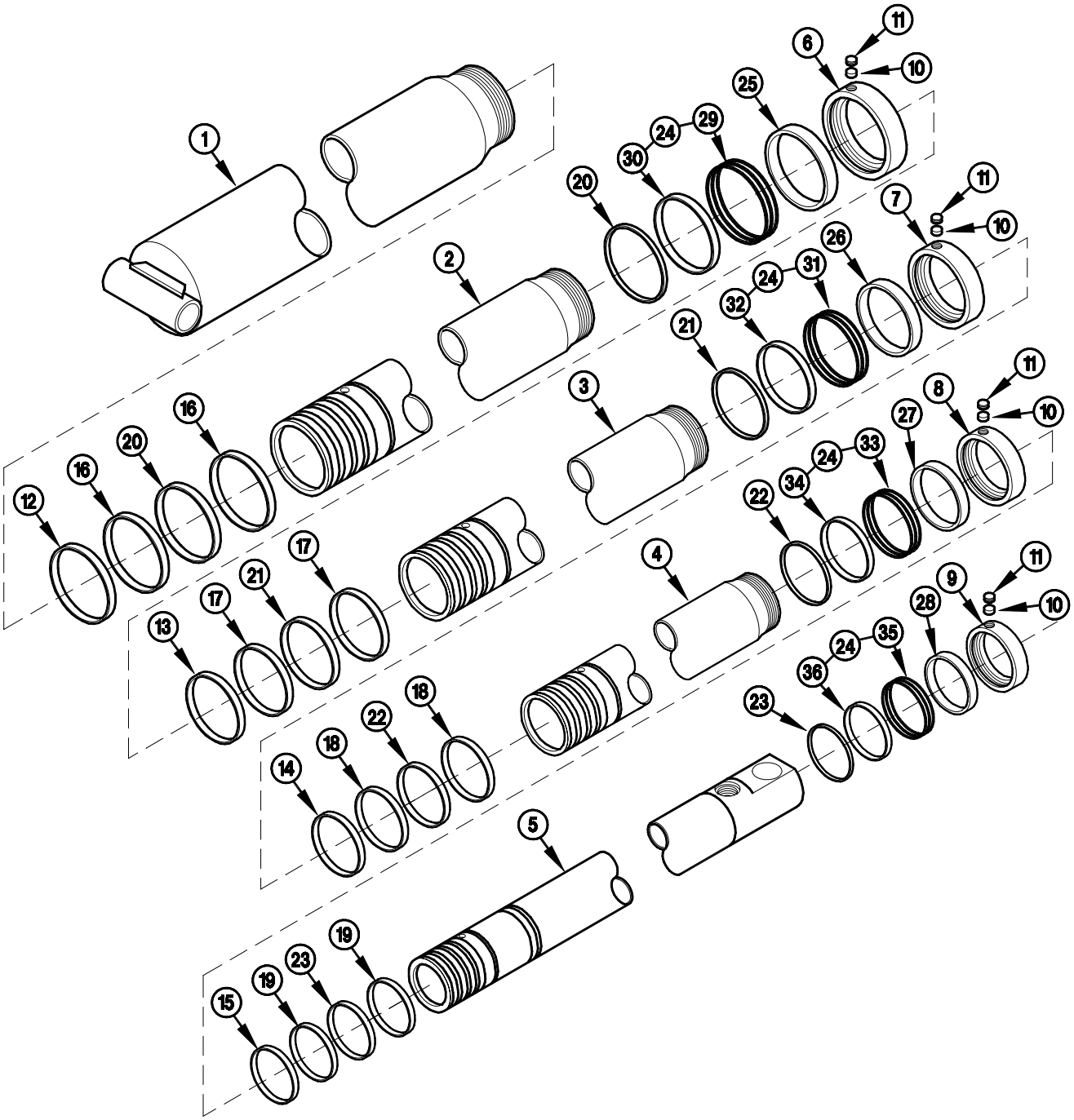
EJECTOR CYLINDER for 20 CU. YD. UNITS
001-6464

REF	PART NO.	DESCRIPTION	REQ'D
1	001-6463-001	BARREL ASSEMBLY	1
2	001-6463-002	SLEEVE ASSEMBLY – 5"	1
3	001-6463-003	SLEEVE ASSEMBLY – 4"	1
4	001-6464-001	PLUNGER ASSEMBLY – 3"	1
5	001-6421-009	GLAND, retaining	1
6	001-6421-010	GLAND, retaining	1
7	001-6421-011	GLAND, retaining	1
8	NSS	SLUG, nylon	4
9	001-3689-021	SETSCREW	4
10	NSS	RING, wear	2
11	NSS	RING, wear	2
12	NSS	RING, wear	2
13	NSS	RING, piston	2
14	NSS	RING, piston	2
15	NSS	RING, piston	2
16	001-4881-022	RING, retaining – internal	1
17	001-4881-025	RING, retaining – internal	1
18	001-4881-020	RING, retaining – internal	1
19	001-3742-003	KIT, build – packing - (consists of items 23 thru 28)	1
20	NSS	RING, guide – top	1
21	NSS	RING, guide – top	1
22	NSS	RING, guide – top	1
23	NSS	PACKING SET (see item 19)	1
24	NSS	WIPER (see item 19)	1
25	NSS	PACKING SET (see item 19)	1
26	NSS	WIPER (see item 19)	1
27	NSS	PACKING SET (see item 19)	1
28	NSS	WIPER (see item 19)	1

-	272-4881	KIT, cylinder rebuild (consists of items 8, 10 thru 15 & 19 thru 22)	A/R

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EJECTOR CYLINDER FOR 25 cu. yd. Body
001-6427



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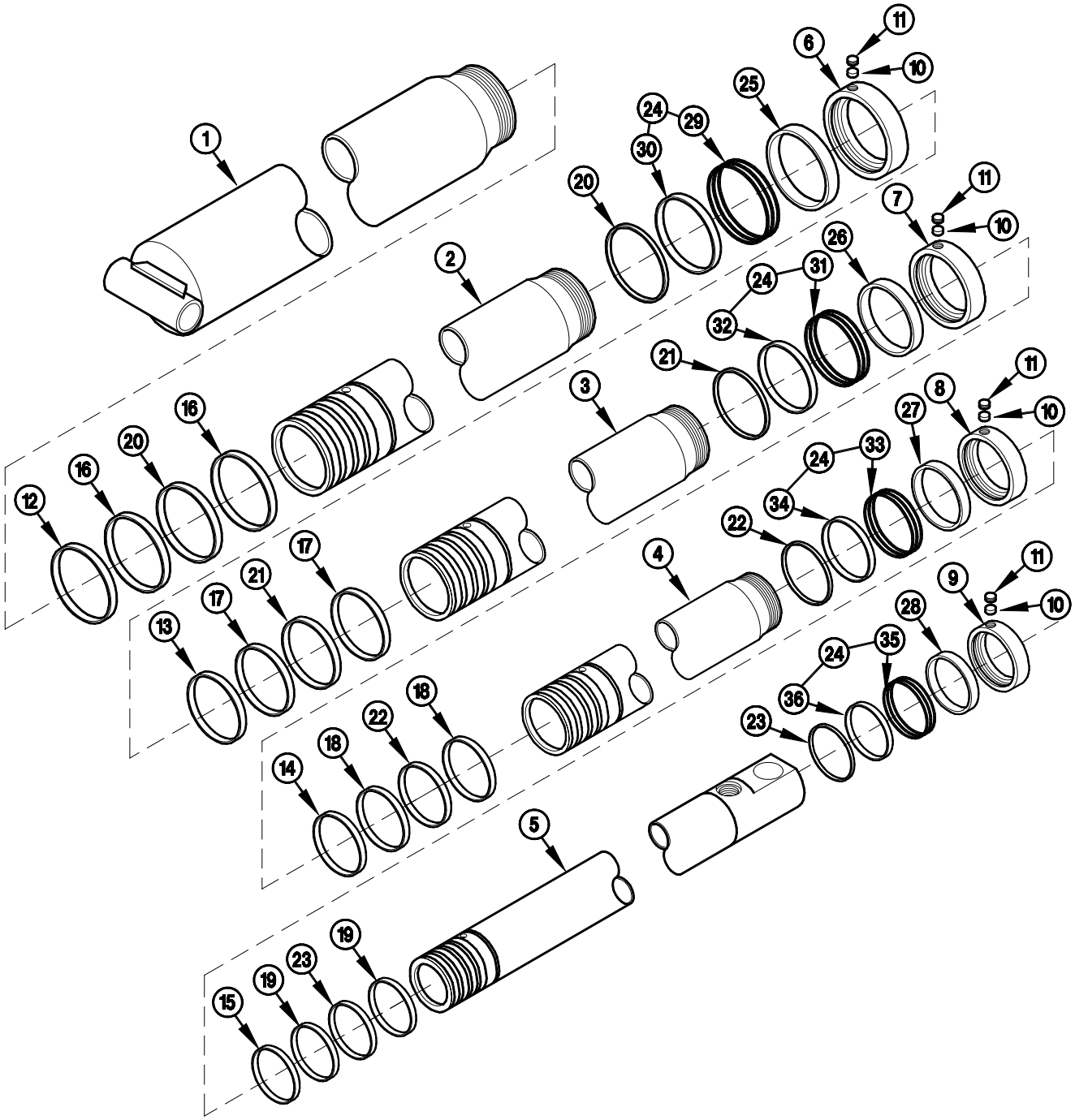
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EJECTOR CYLINDER FOR 25 cu. yd. Body
001-6427

REF	PART NO.	DESCRIPTION	REQ'D
1	001-6426-001	BARREL ASSEMBLY	1
2	001-6426-003	SLEEVE ASSEMBLY – 6"	1
3	001-6426-004	SLEEVE ASSEMBLY – 5"	1
4	001-6426-005	SLEEVE ASSEMBLY – 4"	1
5	001-6427-006	PLUNGER ASSEMBLY – 3"	1
6	001-6421-008	GLAND, retaining	1
7	001-6421-009	GLAND, retaining	1
8	001-6421-010	GLAND, retaining	1
9	001-6421-011	GLAND, retaining	1
10	NSS	SLUG, nylon	4
11	001-3689-021	SETSCREW	4
12	NSS	RING, wear	2
13	NSS	RING, wear	2
14	NSS	RING, wear	2
15	NSS	RING, wear	2
16	001-3743-007	RING, piston	2
17	001-4881-002	RING, piston	2
18	NSS	RING, piston	2
19	NSS	RING, piston	2
20	001-3743-008	RING, retaining – internal	1
21	001-4881-022	RING, retaining – internal	1
22	001-4881-025	RING, retaining – internal	1
23	001-4881-020	RING, retaining – internal	1
24	001-6426-012	KIT, build – packing - (consists of items 29 thru 38)	1
25	NSS	RING, guide – top	1
26	NSS	RING, guide – top	1
27	NSS	RING, guide – top	1
28	NSS	RING, guide – top	1
29	NSS	PACKING SET (see item 12)	1
30	NSS	WIPER (see item 12)	1
31	NSS	PACKING SET (see item 12)	1
32	NSS	WIPER (see item 12)	1
33	NSS	PACKING SET (see item 12)	1
34	NSS	WIPER (see item 12)	1
35	NSS	PACKING SET (see item 12)	1
36	NSS	WIPER (see item 12)	1
-	272-4880	KIT, cylinder rebuild (consists of items 10, 12 thru 19 & 24 thru 28)	A/R

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EJECTOR CYLINDER FOR 27 cu. yd. Body
001-6426



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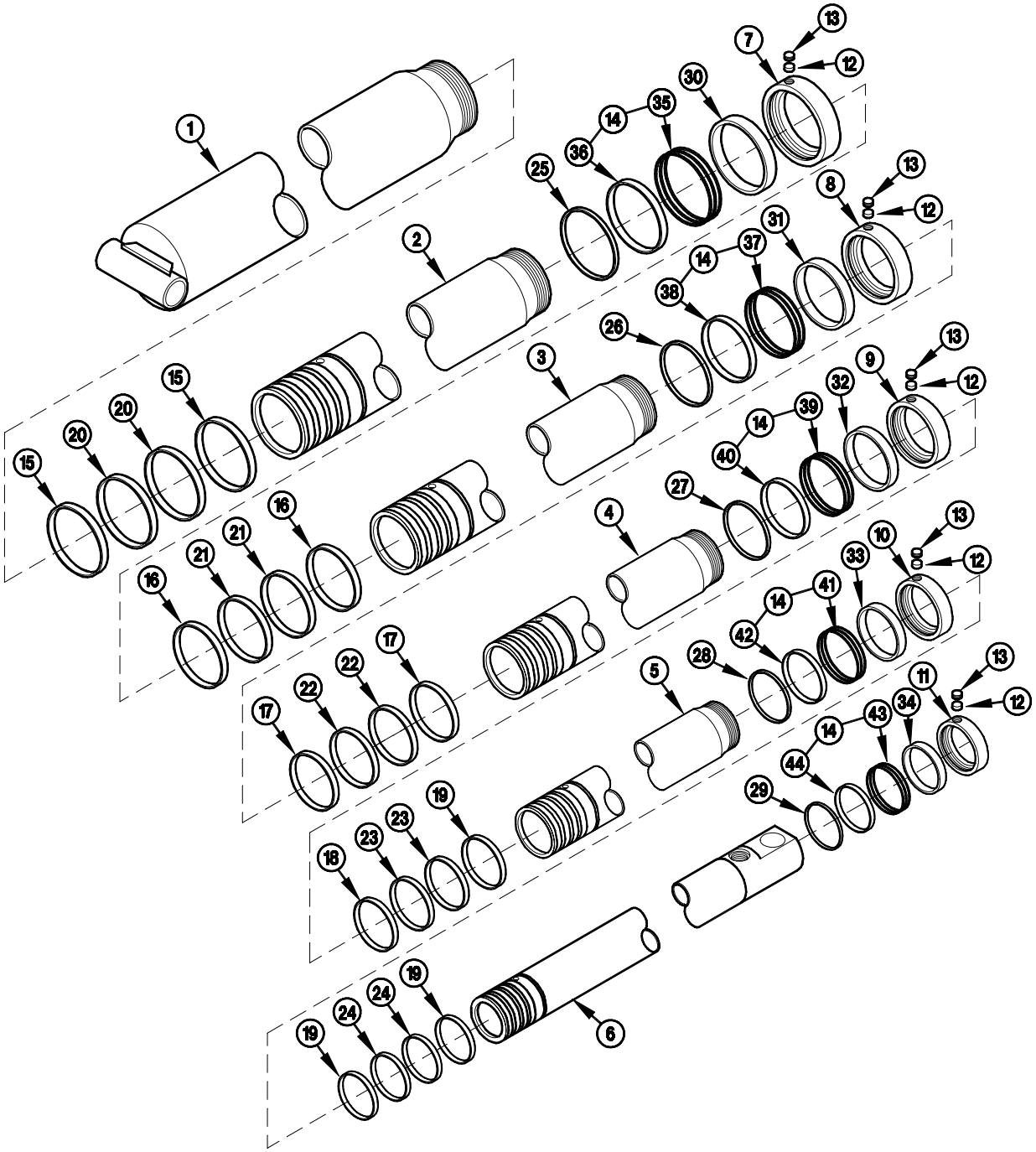
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EJECTOR CYLINDER FOR 27 cu. yd. Body
001-6426

REF	PART NO.	DESCRIPTION	REQ'D
1	001-6426-001	BARREL ASSEMBLY	1
2	001-6426-003	SLEEVE ASSEMBLY – 6"	1
3	001-6426-004	SLEEVE ASSEMBLY – 5"	1
4	001-6426-005	SLEEVE ASSEMBLY – 4"	1
5	001-6426-006	PLUNGER ASSEMBLY – 3"	1
6	001-6421-008	GLAND, retaining	1
7	001-6421-009	GLAND, retaining	1
8	001-6421-010	GLAND, retaining	1
9	001-6421-011	GLAND, retaining	1
10	NSS	SLUG, nylon	4
11	001-3689-021	SETSCREW	4
12	NSS	RING, wear	2
13	NSS	RING, wear	2
14	NSS	RING, wear	2
15	NSS	RING, wear	2
16	NSS	RING, piston	2
17	NSS	RING, piston	2
18	NSS	RING, piston	2
19	NSS	RING, piston	2
20	001-3743-008	RING, retaining – internal	1
21	001-4881-022	RING, retaining – internal	1
22	001-4881-025	RING, retaining – internal	1
23	001-4881-020	RING, retaining – internal	1
24	001-6426-012	KIT, build – packing - (consists of items 29 thru 38)	1
25	NSS NSS	RING, guide – top	1
26	NSS	RING, guide – top	1
27	NSS	RING, guide – top	1
28	NSS	RING, guide – top	1
29	NSS	PACKING SET (see item 12)	1
30	NSS	WIPER (see item 12)	1
31	NSS	PACKING SET (see item 12)	1
32	NSS	WIPER (see item 12)	1
33	NSS	PACKING SET (see item 12)	1
34	NSS	WIPER (see item 12)	1
35	NSS	PACKING SET (see item 12)	1
36	NSS	WIPER (see item 12)	1
-	272-4880	KIT, cylinder rebuild (consists of items 10, 12 thru 19 & 24 thru 28)	A/R

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EJECTOR CYLINDER FOR 32 cu. yd. Body
001-6421



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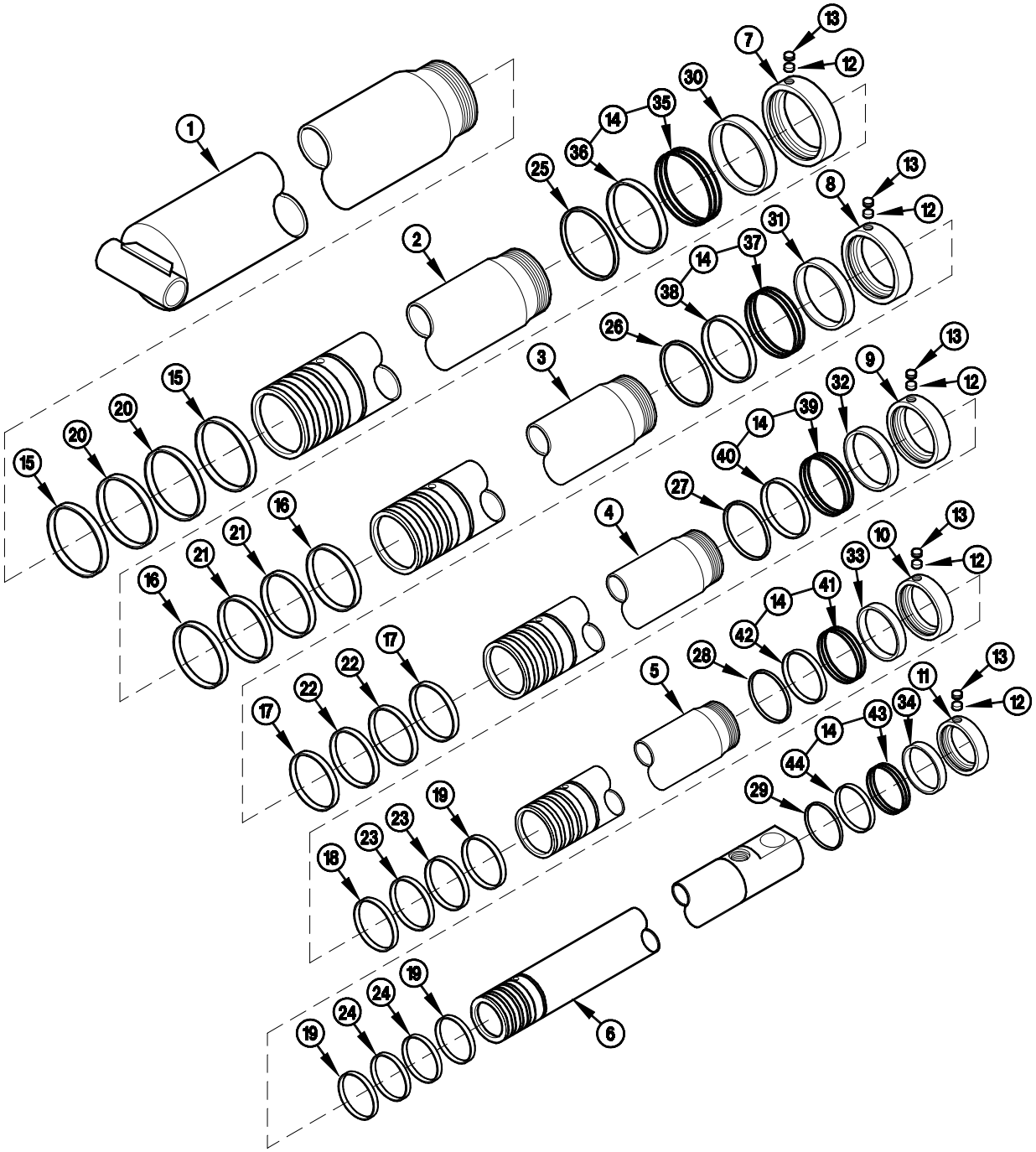
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EJECTOR CYLINDER FOR 32 cu. yd. Body
001-6421

REF	PART NO.	DESCRIPTION	REQ'D
1	001-6421-001	BARREL ASSEMBLY	1
2	001-6421-002	SLEEVE ASSEMBLY – 7"	1
3	001-6421-003	SLEEVE ASSEMBLY – 6"	1
4	001-6421-004	SLEEVE ASSEMBLY – 5"	1
5	001-6421-005	SLEEVE ASSEMBLY – 4"	1
6	001-6421-006	PLUNGER ASSEMBLY – 3"	1
7	001-6421-007	GLAND, retaining	1
8	001-6421-008	GLAND, retaining	1
9	001-6421-009	GLAND, retaining	1
10	001-6421-010	GLAND, retaining	1
11	001-6421-011	GLAND, retaining	1
12	NSS	SLUG, nylon	5
13	NSS	SETSCREW	5
14	001-6421-012	KIT, build – packing - (consists of items 35 thru 44)	1
15	NSS	RING, wear	2
16	NSS	RING, wear	2
17	NSS	RING, wear	2
18	NSS	RING, wear	2
19	NSS	RING, wear	2
20	NSS	RING, piston	2
21	NSS	RING, piston	2
22	NSS	RING, piston	2
23	NSS	RING, piston	2
24	NSS	RING, piston	2
25	001-6421-015	RING, retaining – internal	1
26	001-3743-008	RING, retaining – internal	1
27	001-4881-022	RING, retaining – internal	1
28	001-3689-025	RING, retaining – internal	1
29	001-4881-020	RING, retaining – internal	1
30	001-6421-016	RING, guide – top	1
31	001-6421-017	RING, guide – top	1
32	001-6421-018	RING, guide – top	1
33	001-6121-012	RING, guide – top	1
34	001-6121-010	RING, guide – top	1

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EJECTOR CYLINDER for 32 Cu. Yd. BODY
1-6421



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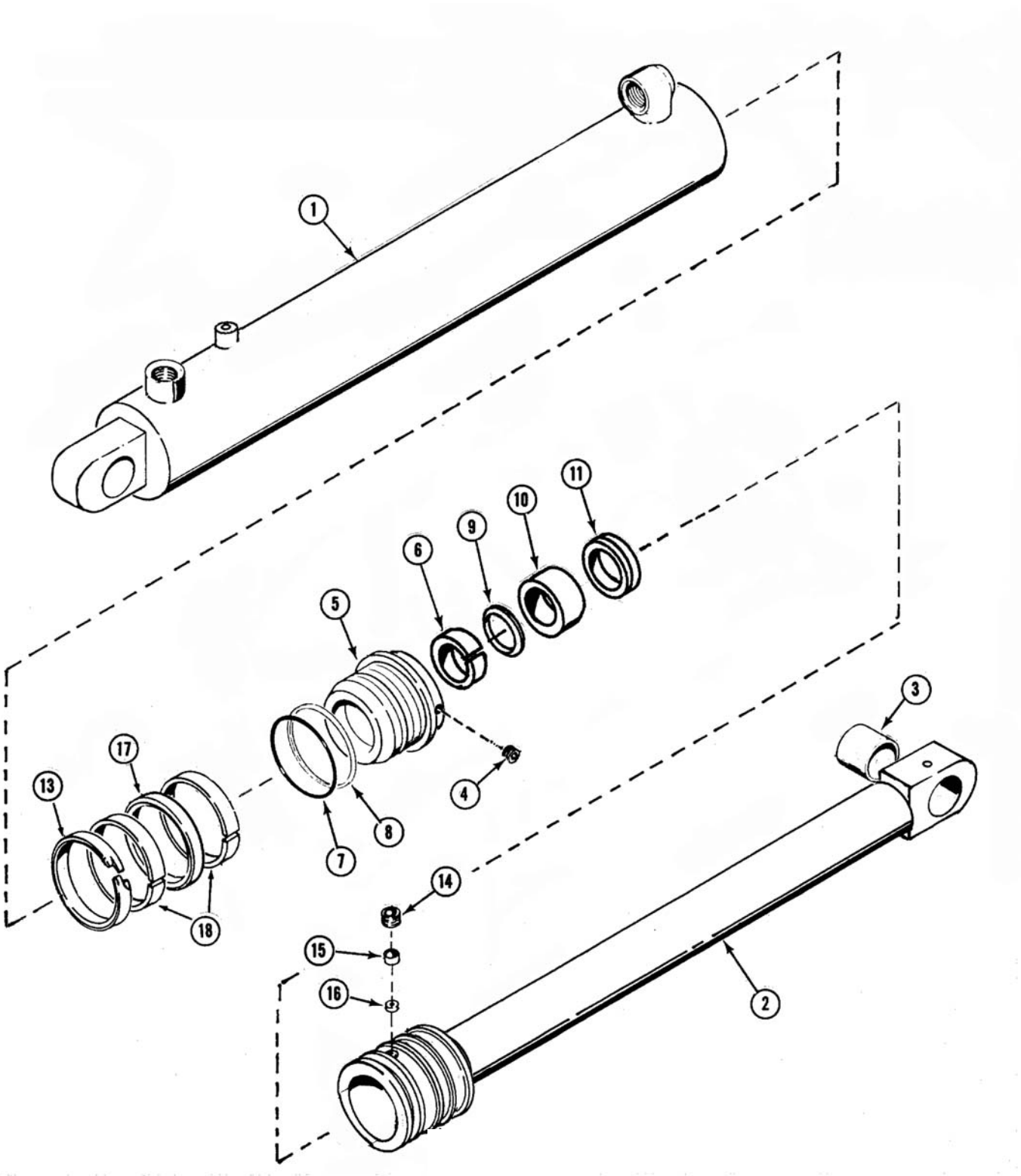
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EJECTOR CYLINDER for 32 Cu. Yd. BODY
1-6421

REF	PART NO.	DESCRIPTION	REQ'D
35	NSS	PACKING SET (see item 14)	1
36	NSS	WIPER (see item 14)	1
37	NSS	PACKING SET (see item 14)	1
38	NSS	WIPER (see item 14)	1
39	NSS	PACKING SET (see item 14)	1
40	NSS	WIPER (see item 14)	1
41	NSS	PACKING SET (see item 14)	1
42	NSS	WIPER (see item 14)	1
43	NSS	PACKING SET (see item 14)	1
44	NSS	WIPER (see item 14)	1
-	272-8484	KIT, cylinder rebuild (consists of items 12 thru 24 & 29 thru 34)	A/R

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INSIDE (LOWER PANEL) CYLINDER
001-6611



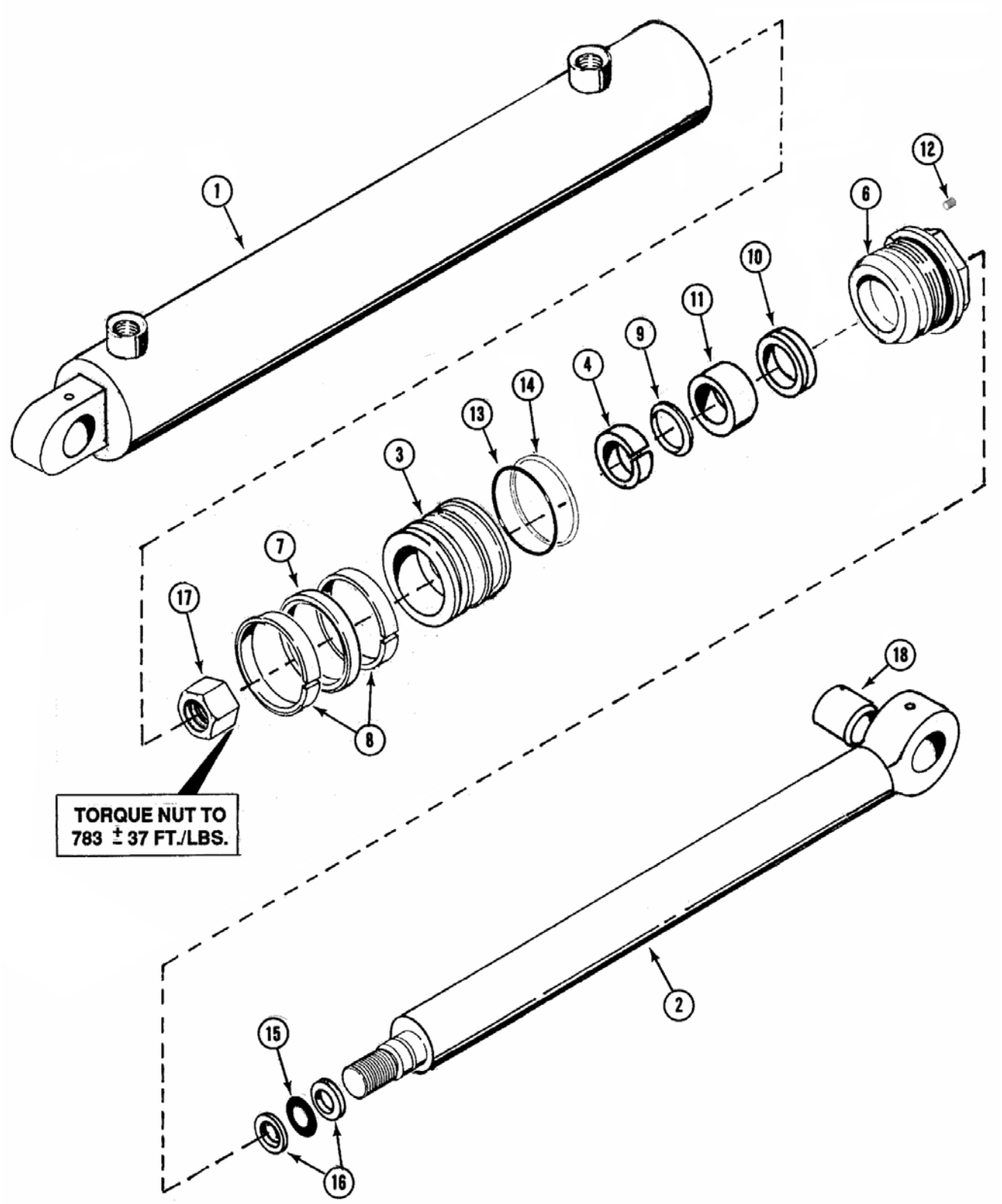
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INSIDE (LOWER PANEL) CYLINDER
001-6611

REF	PART NO.	DESCRIPTION	REQ'D
1	001-6611-001	BARREL ASSEMBLY	1
2	001-6611-002	ROD ASSEMBLY	1
3	003-3587	BUSHING	1
4	FS440920	SETSCREW – 1/4" - 20NC x 1/2"	1
5	001-6611-003	GLAND	1
6	NSS	RING, wear	1
7	NSS	O-RING	1
8	NSS	RING, back-up	1
9	NSS	RING, buffer	1
10	NSS	SEAL, rod	1
11	NSS	WIPER, canned	1
13	NSS	RING, piston	1
14	047-1792-002	RETAINER, orifice	1
15	018-0747	SLEEVE, orifice	1
16	025-0451-004	ORIFICE	1
17	NSS	T-SEAL, capped	1
18	NSS	RING, wear	2
-	001-6611-004	KIT, repair (consists of items 6 thru 13, 17, 18)	A/R

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OUTSIDE (UPPER PANEL) CYLINDER
1-6610



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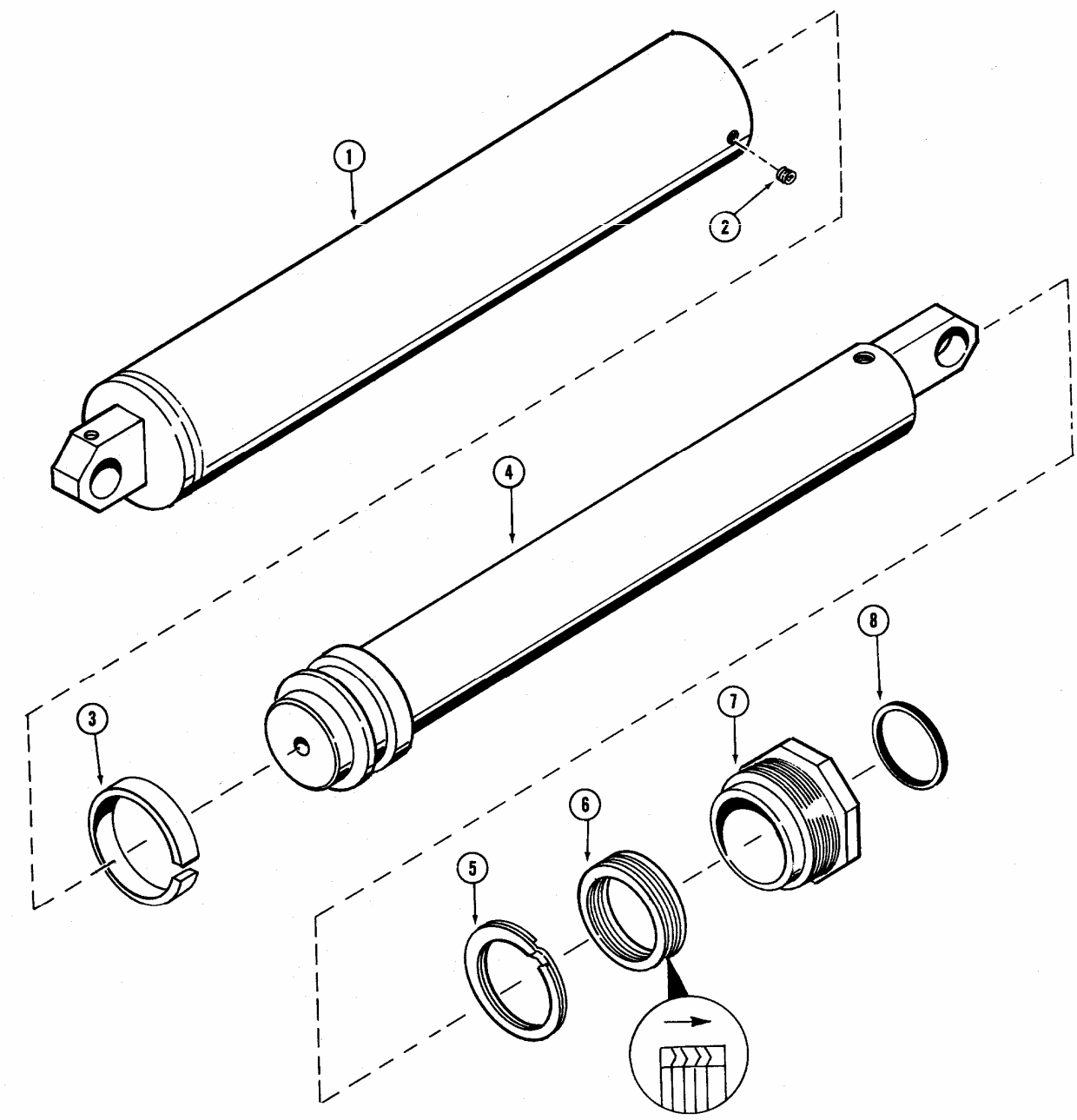
OUTSIDE (UPPER PANEL) CYLINDER
1-6610

REF	PART NO.	DESCRIPTION	REQ'D
1	001-6610-011	BARREL ASSEMBLY	A/R
2	001-6610-002	ROD ASSEMBLY	1
3	001-5110-003	PISTON	1
4	NSS	RING, wear	1
6	001-6610-004	GLAND	1
7	NSS	T-SEAL, capped	1
8	NSS	RING, wear	2
9	NSS	RING, buffer	1
10	NSS	WIPER, canned	1
11	NSS	SEAL, rod	1
12	FS440920	SETSCREW – 1/4" – 20 NC x 1/2"	1
13	NSS	O-RING	1
14	NSS	RING, backup	1
15	NSS	O-RING	1
16	NSS	RING, backup	2
17	FS313175	NUT, lock – 1 3/4" – 12	1
18	003-3588	BUSHING	1

-	001-6610-007	KIT, seal repair – (consists of items 4, 7 thru 11, 13 thru 16)	A/R

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TAILGATE RAISE CYLINDER
001-4880



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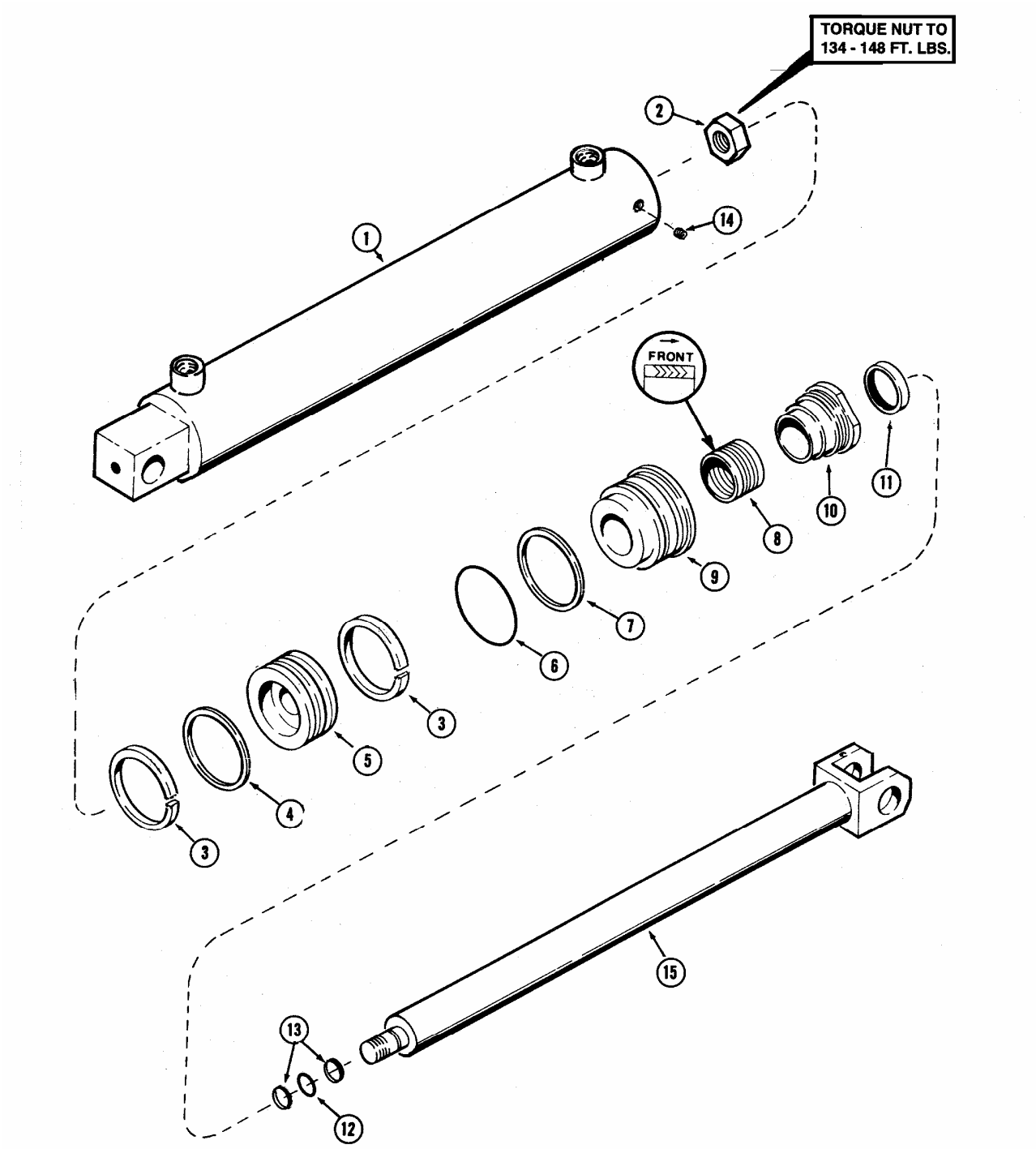
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TAILGATE RAISE CYLINDER
001-4880

REF	PART NO.	DESCRIPTION	REQ'D
1	085-0650	BARREL	1
2	FS440707	SETSCREW – 1/4" – 20NC x 1/4"	1
3	NSS	RING, wear	1
4	027-4599	ROD ASSEMBLY	1
5	NSS	RING, retaining	1
6	NSS	V-PACKING (set)	1
7	023-0637	GLAND, packing	1
8	NSS	RING, wiper	1
-	272-0938	SEAL KIT – (consists of items 3, 5, 6, 8)	1

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CONTAINER ARM MECHANISM CYLINDER
001-4283



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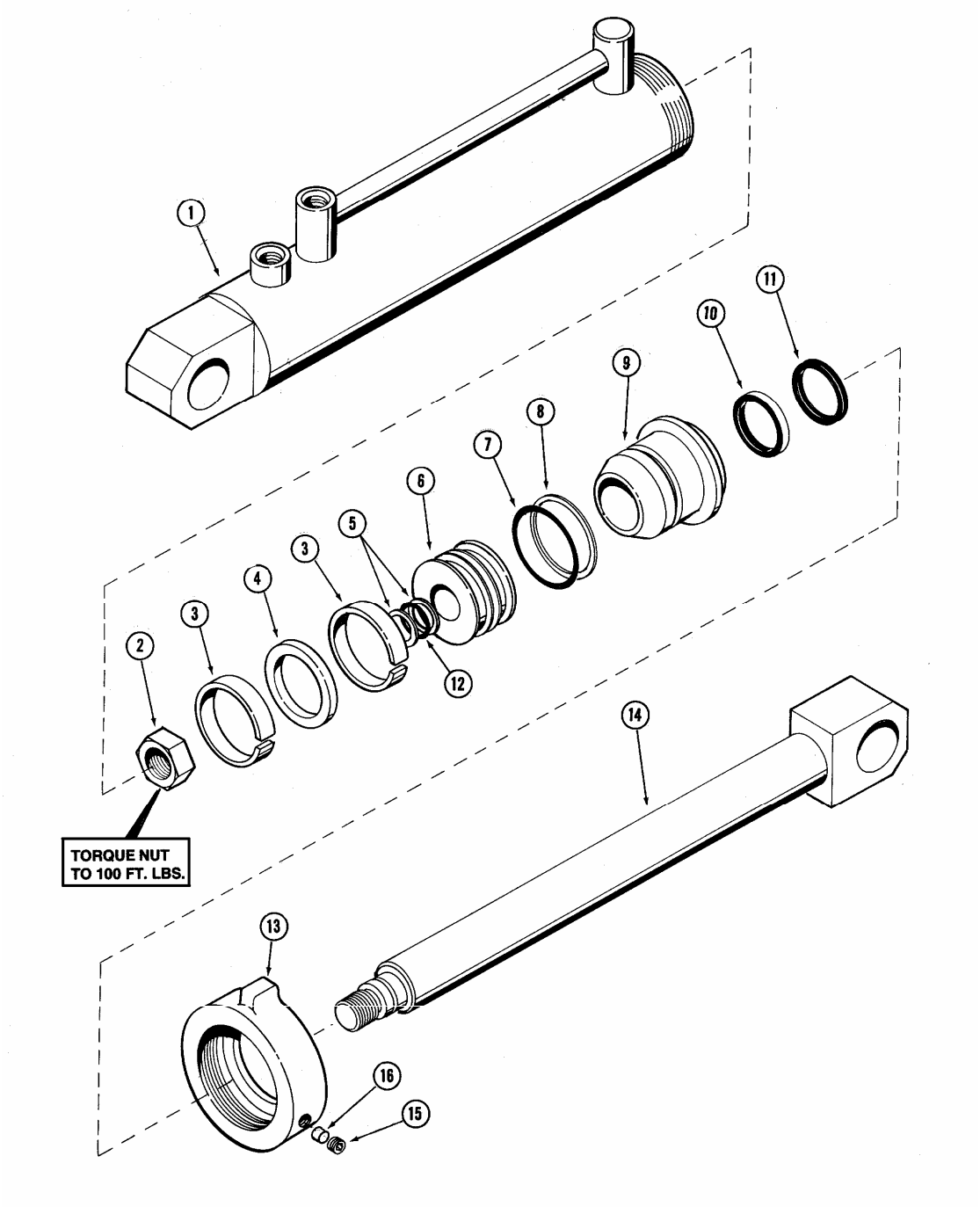
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CONTAINER ARM MECHANISM CYLINDER
001-4283

REF	PART NO.	DESCRIPTION	REQ'D
1	085-0387	BARREL	1
2	FS271700	NUT, lock – 7/8" – 14NF (torque to 134-148 ft./lbs.)	1
3	NSS	RING, wear	2
4	NSS	RING, solid seal	1
5	024-0712	PISTON	1
6	NSS	O-RING	1
7	NSS	RING, back-up	1
8	NSS	V-PACKING (set)	1
9	023-0686	GLAND, packing	1
10	023-0672	NUT, packing	1
11	NSS	WIPER	1
12	NSS	O-RING	1
13	NSS	RING, back-up	2
14	FS440707	SETSCREW	1
15	027-4199	ROD ASSEMBLY	1
-	272-0966	SEAL KIT – consists of items 3, 4, 6, 7, 8, 11 thru 13)	A/R

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ROLL BAR MECHANISM CYLINDER
001-4105



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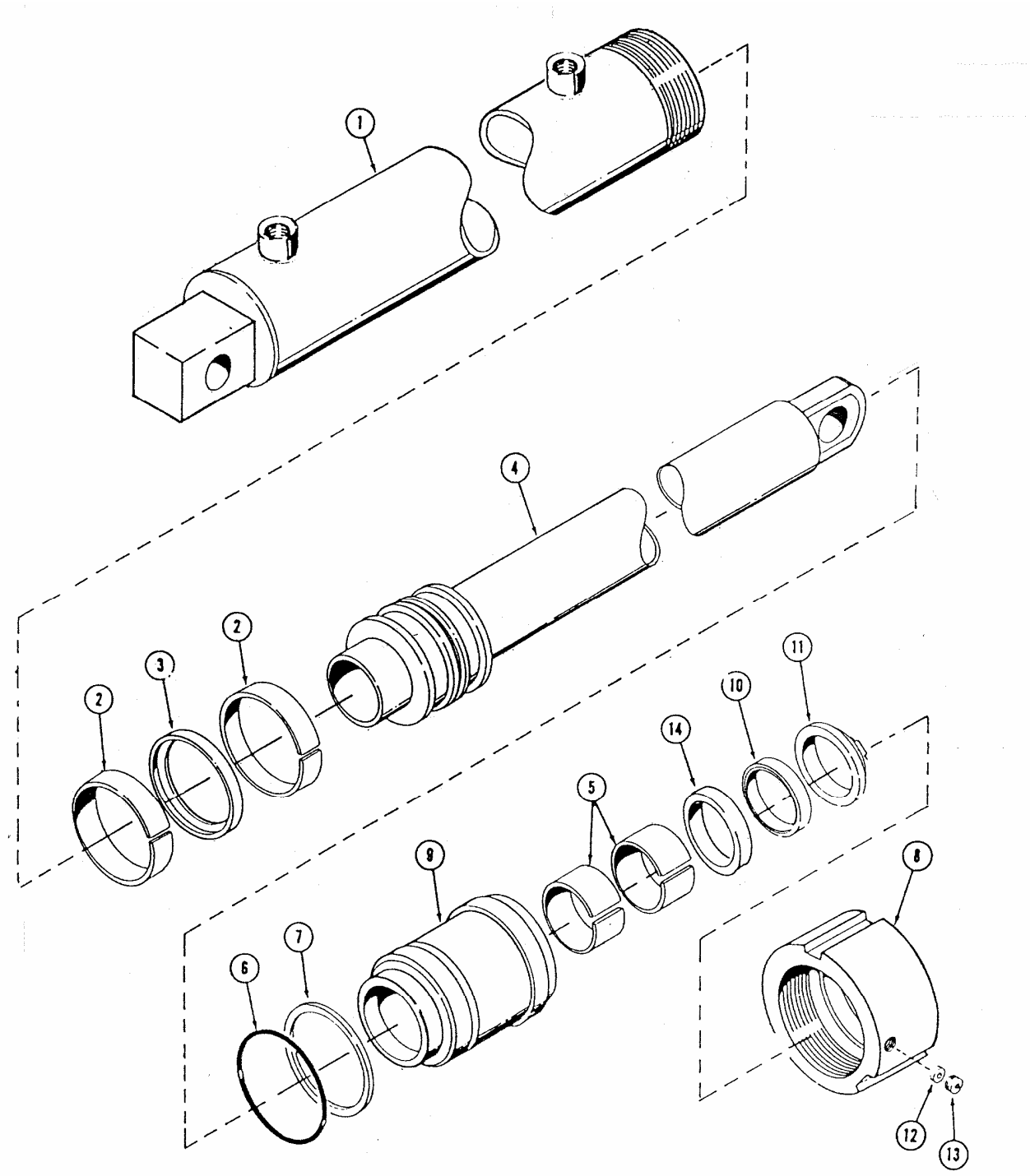
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ROLL BAR MECHANISM CYLINDER
001-4105

REF	PART NO.	DESCRIPTION	REQ'D
1	085-0168	BARREL	1
2	FS271700	NUT, lock – 7/8" (torque to 100 ft./lbs.)	1
3	NSS	RING, wear	2
4	NSS	RING, solid seal	1
5	NSS	RING, back-up	2
6	024-0706	PISTON	1
7	NSS	O-RING	1
8	NSS	RING, back-up	1
9	NSS	GLAND, packing	1
10	NSS	SEAL, rod	1
11	NSS	WIPER	1
12	NSS	O-RING	1
13	023-0664	GLAND, retaining	1
14	027-4176	ROD ASSEMBLY	1
15	FS440909	SETSCREW – 3/8"	1
16	047-1520	SLUG, nylon	1
-	272-0958	SEAL KIT – (consists of items 3, 4, 5, 7 thru 12)	A/R

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REEVING CYLINDER
001-6061



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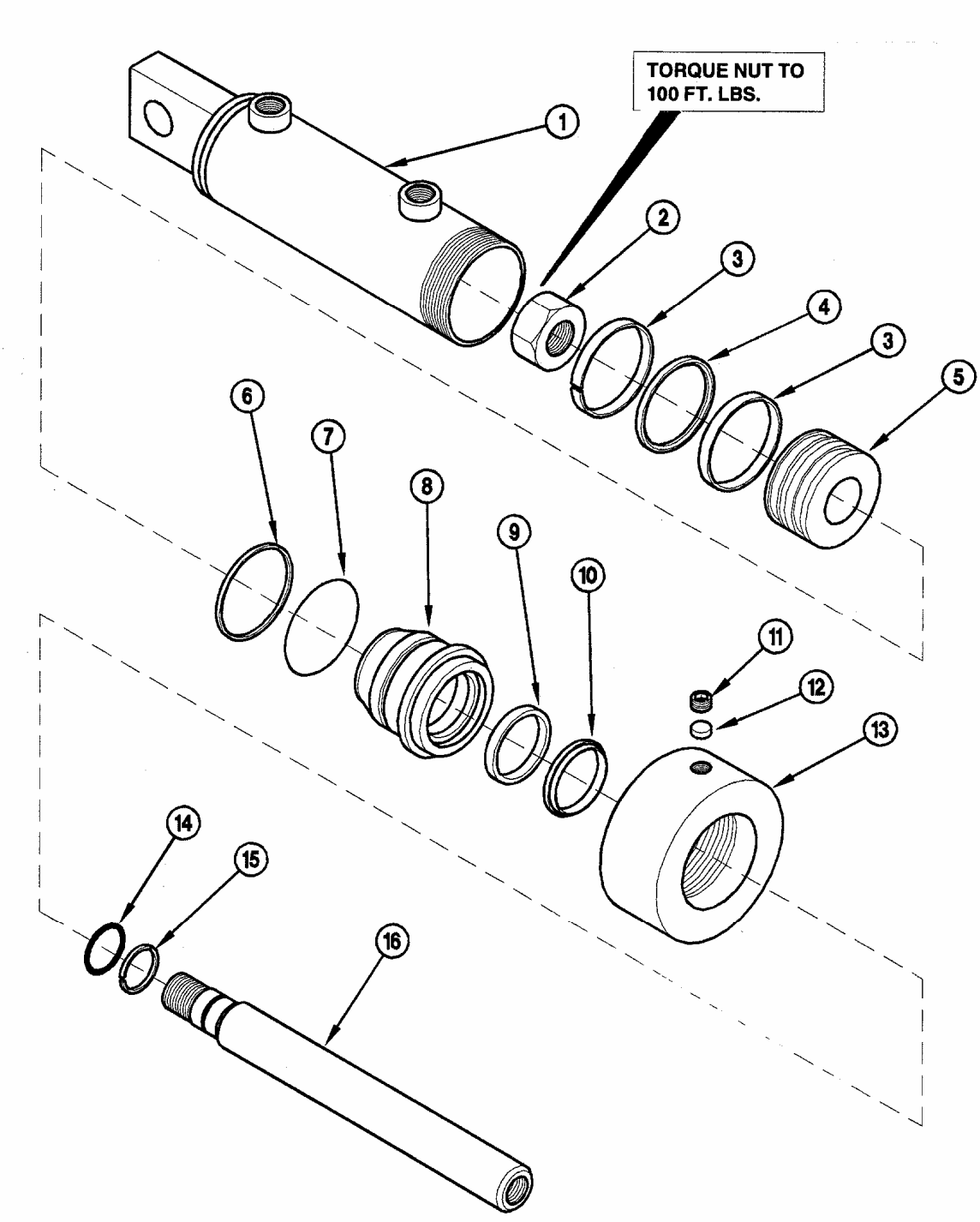
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REEVING CYLINDER
001-6061

REF	PART NO.	DESCRIPTION	REQ'D
1	001-6061-001	BARREL	1
2	NSS	RING, wear	2
3	NSS	RING, solid seal	1
4	001-6061-002	PLUNGER ASSEMBLY	1
5	NSS	RING, wear	2
6	NSS	O-RING	1
7	NSS	RING, back-up	1
8	023-0668	GLAND, retaining	1
9	023-0713	GLAND, packing	1
10	NSS	SEAL, single lip	1
11	NSS	WIPER	1
12	047-1520	SLUG, nylon	1
13	FS440909	SETSCREW – 3/8"	2
14	026-4265	RING, buffer	1
-	272-0989	SEAL KIT – (consists of items 2, 3, 5, 6, 7, 10, 11)	A/R

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ROLL-BAR FLIPPER CYLINDER
001-5069



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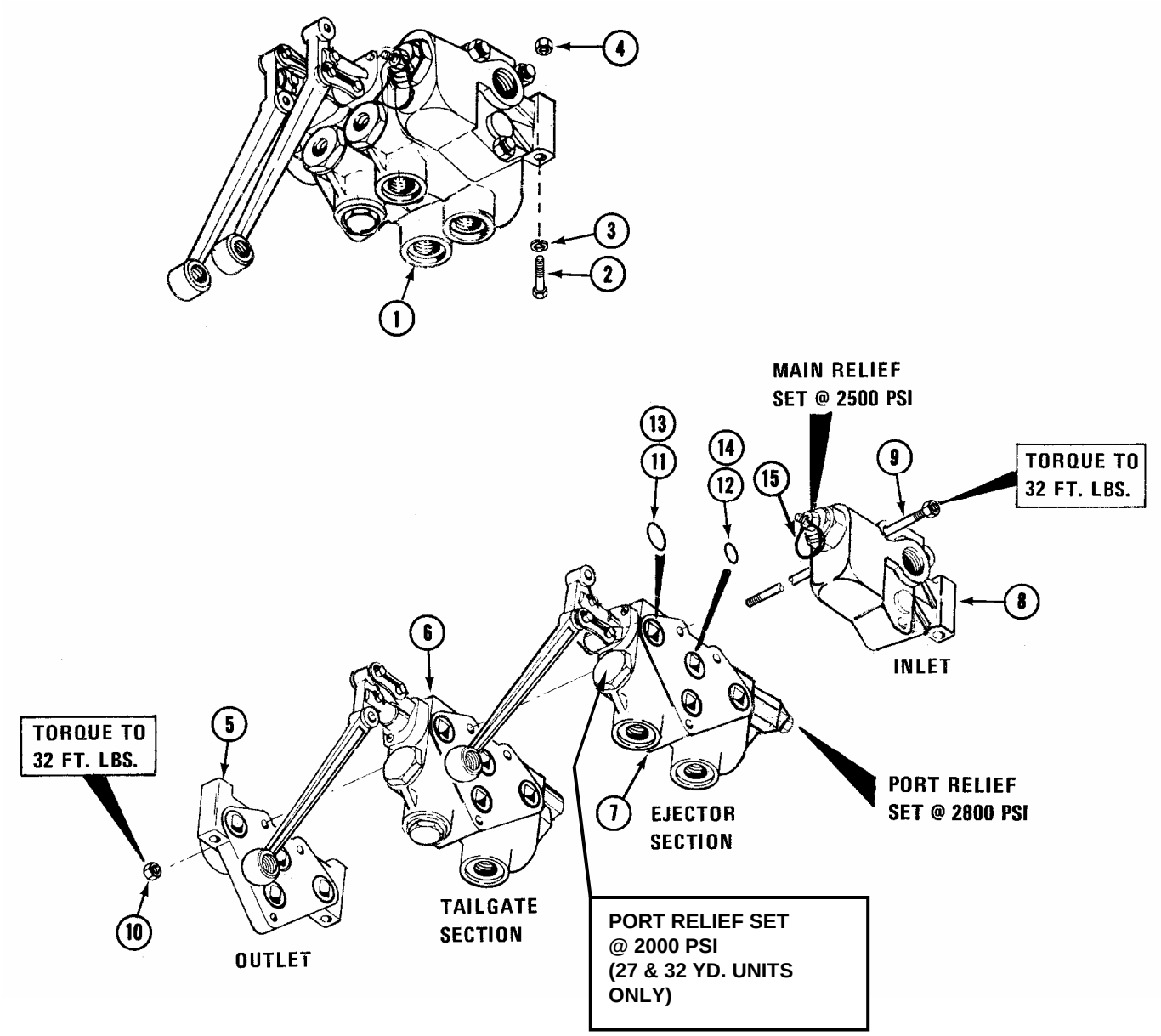
FORMULA 5000

ROLL-BAR FLIPPER CYLINDER
001-5069

REF	PART NO.	DESCRIPTION	REQ'D
1	001-5069-001	BARREL ASSEMBLY	1
2	FS271700	NUT, hex – 7/8" – 14NC	1
3	NSS	RING, wear	2
4	NSS	RING, solid seal	1
5	024-0706	PISTON	1
6	NSS	RING, back-up	1
7	NSS	O-RING	1
8	023-0665	GLAND, packing	1
9	NSS	SEAL, single lip	1
10	NSS	WIPER	1
11	FS440909	SETSCREW – 3./8" – 16NC	1
12	NSS	PLUG, nylon	1
13	023-0694	GLAND, retaining	1
14	NSS	O-RING	1
15	NSS	RING, back-up	1
16	001-5069-002	ROD ASSEMBLY	1
-	272-0958	SEAL KIT, repair (consists of items 3, 4, 6, 7, 9, 10 12, 14, 15)	1

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UNDERBODY CONTROL VALVE
031-3285



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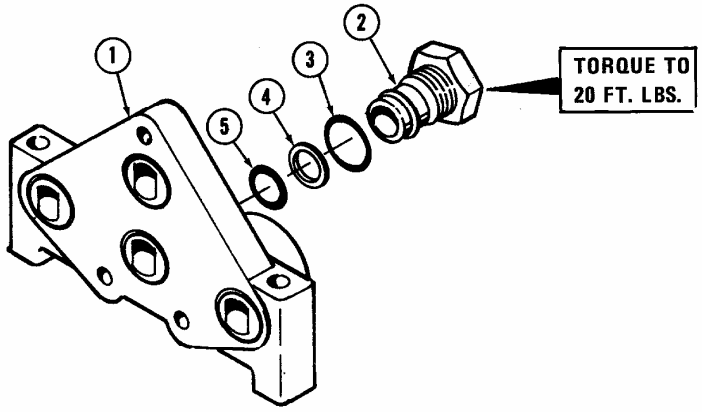
UNDERBODY CONTROL VALVE
031-3285

REF	PART NO.	DESCRIPTION	REQ'D
1	031-3285	VALVE, control	1
2	FS070840	CAPSCREW – 5/16" – 18NC x 3"	3
3	FS550800	WASHER, lock – 5/16"	3
4	FS230800	NUT, lock – 5/16" – 18NC	3
5	REF.	OUTLET SECTION (see page 5.29)	1
6	REF.	SECTION, tailgate (see page 5.33)	1
7	REF.	SECTION, ejector (see page 5.31)	1
8	REF.	INLET (see page 5.29)	1
9	031-3285-051	SCREW – 3/8" – 16 x 6"	3
10	031-3285-052	NUT, hex – 3/8" – 16	3
11	NSS	SEAL, o-ring - .926 I.D. (2/section)	6
12	NSS	SEAL, o-ring - .801 I.D. (2/section)	6
13	NSS	SEAL, o-ring - .914 I.D (2/section)	6
14	NSS	SEAL, o-ring - .799 I.D. (2/section)	6
15	022-3008	WIRE LOCK	1
-	031-3285-048	SEAL KIT (consists of items 11, 12, 13,14 (2 each)	1
-	031-3285-006	STUD KIT (consists of items 9 & 10)	1

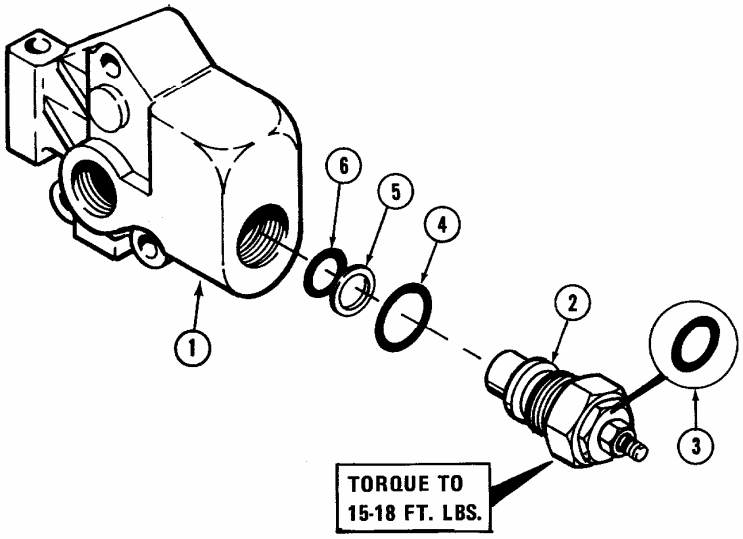
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INLET and OUTLET SECTIONS
031-3285-001 AND 031-3285-003

OUTLET COVER
31-3285-03



INLET COVER
31-3285-01



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INLET and OUTLET SECTIONS
031-3285-001 AND 031-3285-003

OUTLET - 031-3285-003

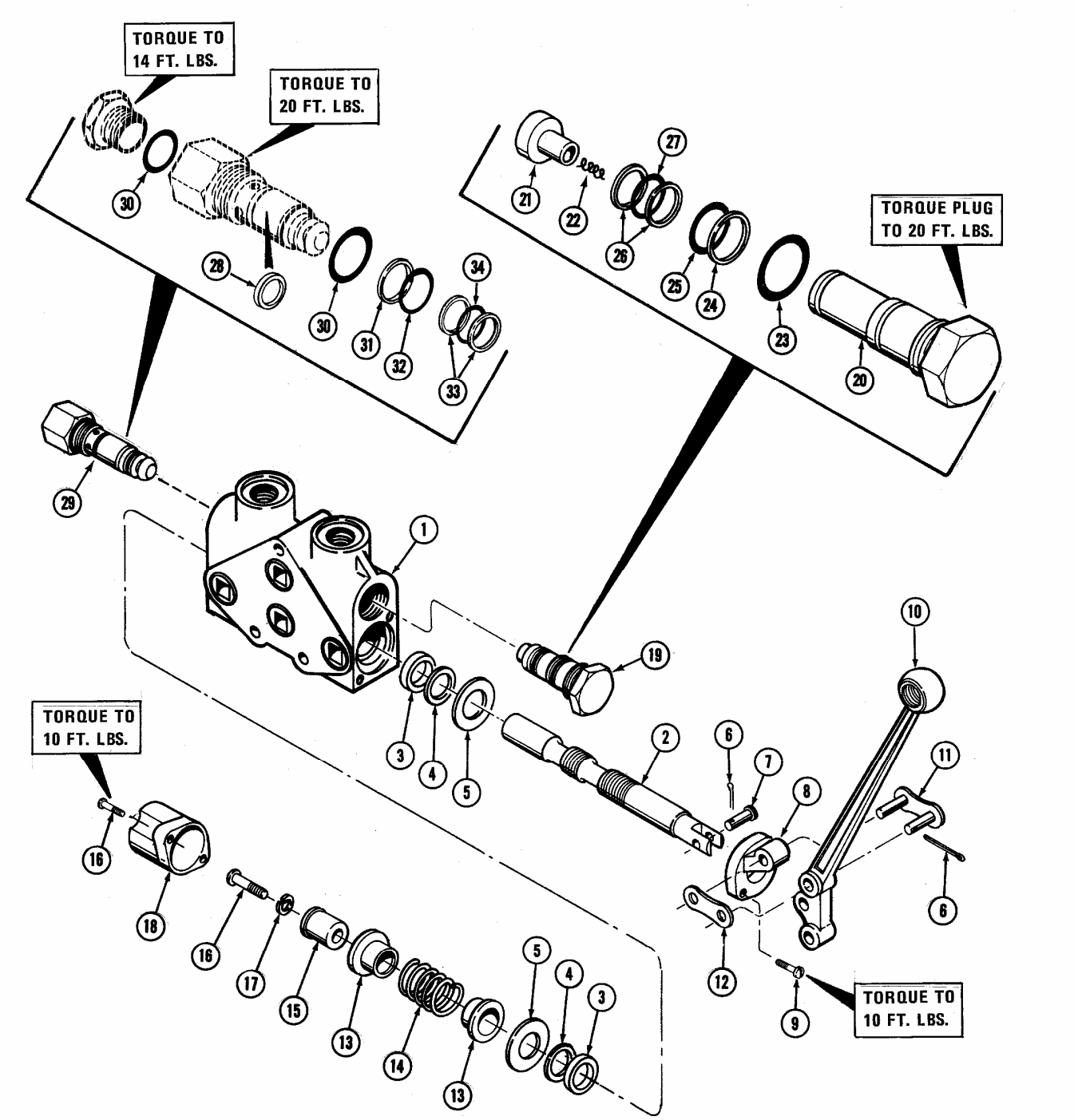
REF	PART NO.	DESCRIPTION	REQ'D
1	031-3285-049	COVER	1
2	031-3285-005	SLEEVE, power beyond	1
3	031-3285-060	SEAL	1
4	031-3285-061	WASHER, back-up	1
5	031-3285-062	SEAL, o-ring	1

INLET - 031-3285-001

REF.	PART NO.	DESCRIPTION	REQ'D
1	031-3285-007	COVER	1
2	031-2979	RELIEF, main	1
3	NSS	SEAL, o-ring	1
4	NSS	SEAL, o-ring	1
5	NSS	RING, back-up	1
6	NSS	SEAL, o-ring	1
-	207-6103	SEAL KIT – (consists of items 3 thru 6)	1

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WORKING VALVE SECTION for EJECTOR FUNCTION
031-3285-002



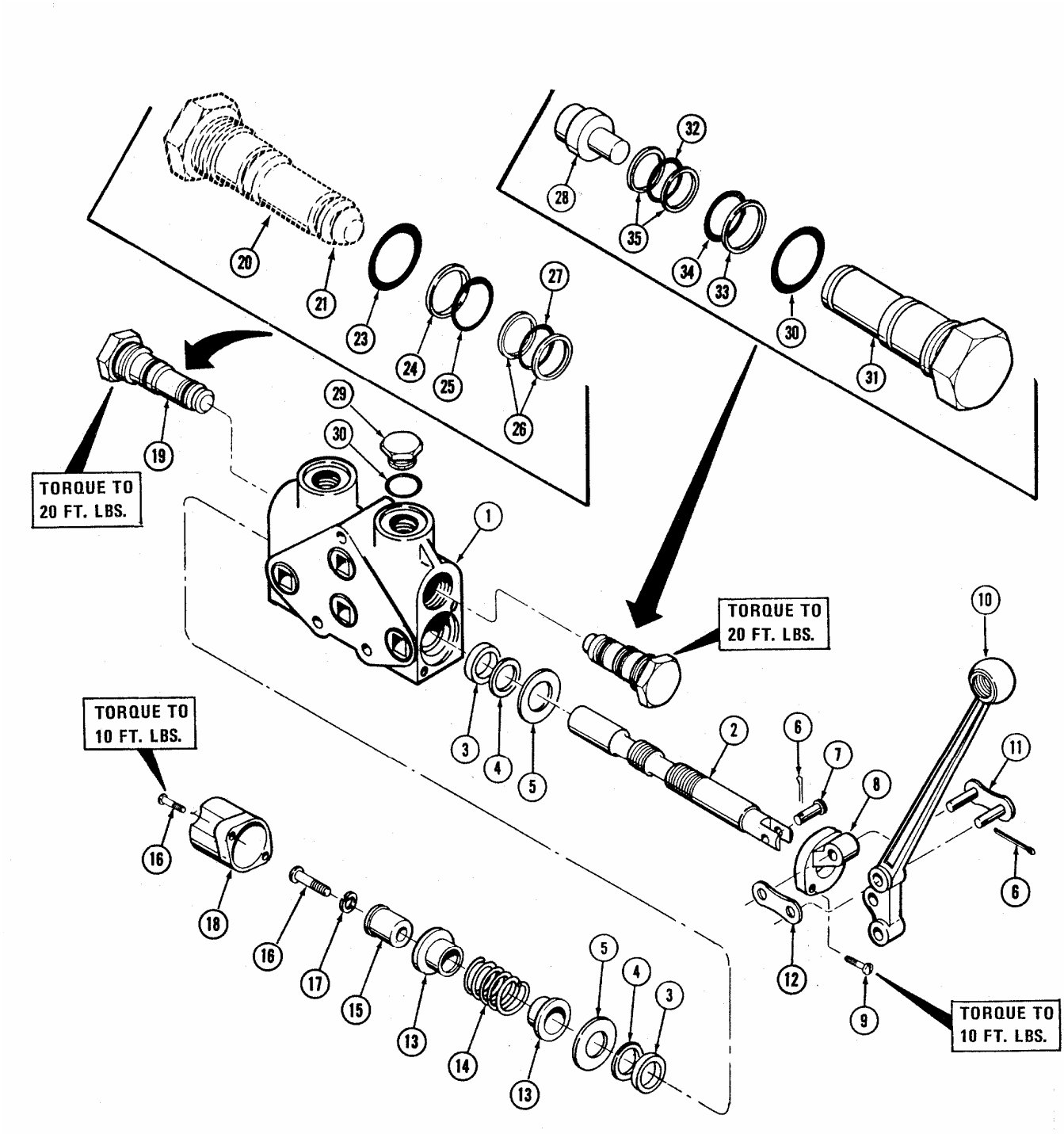
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WORKING VALVE SECTION for EJECTOR FUNCTION
031-3285-002

REF	PART NO.	DESCRIPTION	REQ'D
-	031-3285-002	VALVE SECTION – (consists of items 1 thru 28)	1
1	NSS	HOUSING	1
2	NSS	SPOOL	1
3	NSS	SEAL, spool (see kit A)	2
4	NSS	WASHER, back-up (see kit A)	2
5	207-6035	WASHER, retainer plate	2
-	031-3285-015	HANDLE ASSEMBLY (includes items 6 thru 12)	1
6	031-3285-036	PIN, cotter	3
7	207-5544	PIN	1
8	207-5540	BRACKET	1
9	031-3285-035	CAPSCREW – 1/4" – 20NC x 7/8"	2
10	207-5541	HANDLE	1
11	031-2041-051	LINK	1
12	031-2041-019	PLATE, link	1
-	031-3285-013	POSITIONER, spool (includes items 13 thru 18)	1
13	207-5534	COLLAR, spring	2
14	31-3285-17	SPRING	1
15	31-3285-20	COLLAR, spool	1
16	31-3285-21	CAPSCREW	3
17	31-3285-22	WASHER, lock	2
18	207-5533	BONNET	1
19	31-3285-14	PLUG, load check (consists of items 20 thru 27)	1
20	31-3285-23	PLUG	1
21	31-3285-24	POPPET	1
22	31-3285-25	SPRING	1
23	NSS	SEAL, o-ring (see kit C)	1
24	NSS	WASHER, back-up (outer) (see kit C)	1
25	NSS	SEAL, back-up (outer) (see kit C)	1
26	NSS	WASHER, back-up (inner) (see kit C)	2
27	NSS	SEAL, o-ring (see kit C)	1
28	031-2940-005	RING, piston	1
29	031-3291	VALVE, port relief - (non adjustable) – (includes items 30 thru 34) **order separately-not part of valve**	1
30	NSS	SEAL, o-ring (see kit B)	2
31	NSS	WASHER, back-up (outer) (see kit B)	1
32	NSS	SEAL, o-ring (see kit B)	1
33	NSS	WASHER, back-up (inner) (see kit B)	2
34	NSS	SEAL, o-ring (see kit B)	1
35	031-6137	VALVE, port relief - (non adjustable) – 32 yd units only (includes items 30 thru 34) **order separately-not part of valve**	1
A	031-3285-041	SEAL KIT (consists of items 3, 4)	A/R
B	031-2940-006	SEAL KIT (consists of items 30 thru 34)	A/R
C	031-3285-026	SEAL KIT (consists of items 23 thru 27)	A/R

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WORKING VALVE SECTION for TAILGATE FUNCTION
031-3285-004



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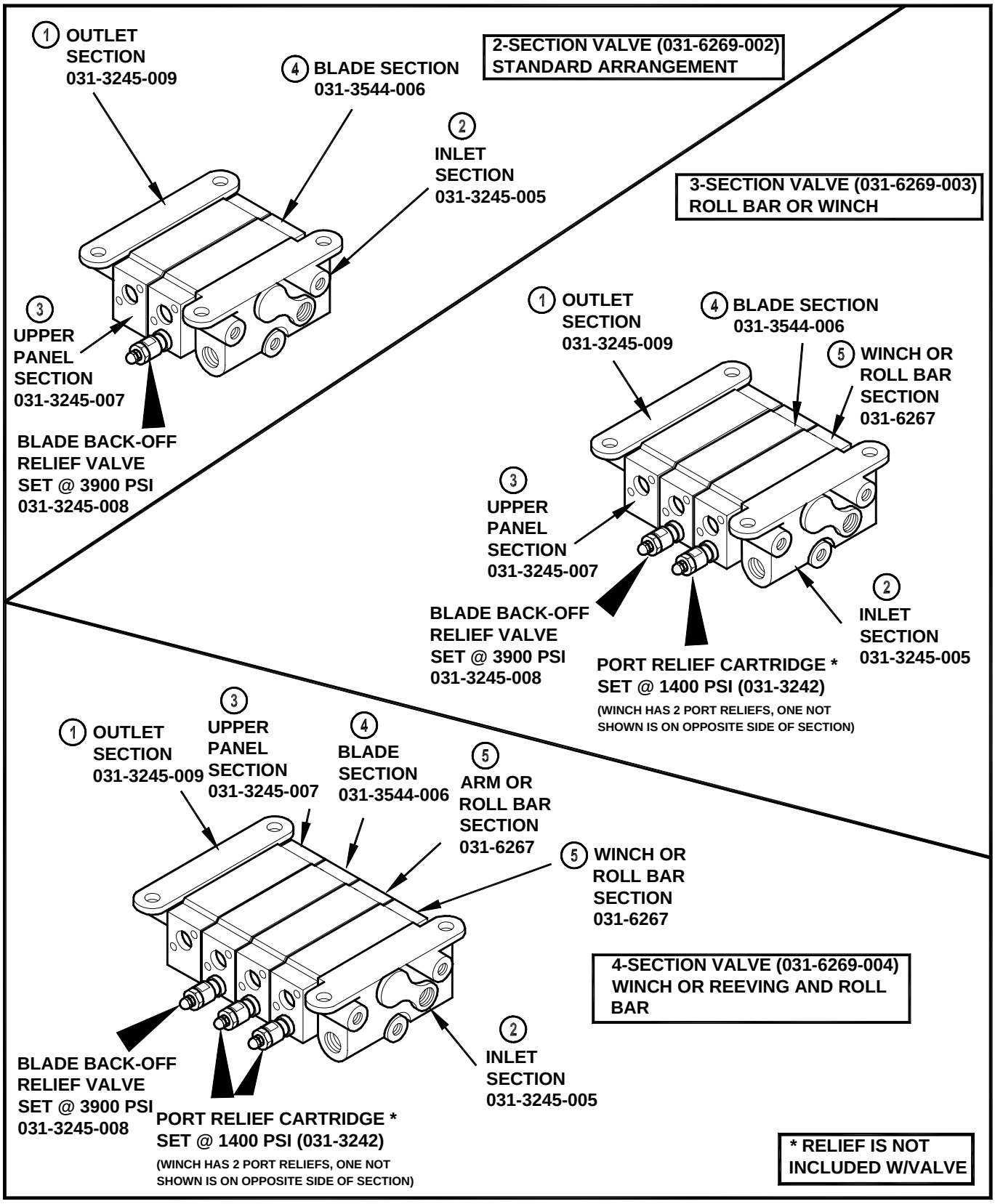
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WORKING VALVE SECTION for TAILGATE FUNCTION
031-3285-004

REF	PART NO.	DESCRIPTION	REQ'D
1	NSS	HOUSING	1
2	NSS	SPOOL (must be ordered as set with housing)	1
3	NSS	SEAL, spool (see kit A)	2
4	NSS	WASHER, back-up (see kit A)	2
5	207-6035	WASHER, retainer plate	2
-	031-3285-015	HANDLE ASSEMBLY (includes items 6 thru 12)	1
6	031-3285-036	PIN, cotter	3
7	207-5544	PIN	1
8	207-5540	BRACKET	1
9	031-3285-035	CAPSCREW – 1/4" – 20NC x 7/8"	2
10	207-5541	HANDLE	1
11	031-2041-051	LINK	1
12	031-2041-019	PLATE, link	1
-	031-3285-013	POSITIONER, spool (includes items 13 thru 18)	1
13	207-5534	COLLAR, spring	2
14	031-3285-017	SPRING	1
15	031-3285-020	COLLAR, spool	1
16	031-3285-021	CAPSCREW	3
17	031-3285-022	WASHER, lock	2
18	207-5533	BONNET	1
19	031-3285-014	PLUG, load check (consists of items 20 thru 27)	1
20	031-3285-023	PLUG	1
21	031-3285-024	POPPET	1
22	031-3285-025	SPRING	1
23	NSS	SEAL, o-ring (see kit C)	1
24	NSS	WASHER, back-up (outer) (see kit C)	1
25	NSS	SEAL, back-up (outer) (see kit C)	1
26	NSS	WASHER, back-up (inner) (see kit C)	2
27	NSS	SEAL, o-ring (see kit C)	1
28	031-3285-045	PLUG, 3-way	1
29	031-3285-044	PLUG (SAE #10)	1
30	NSS	SEAL, o-ring (see kit B)	2
31	031-3285-043	PLUG, check	1
32	NSS	SEAL, o-ring (see kit B)	1
33	NSS	WASHER, back-up (outer) (see kit B)	1
34	NSS	SEAL, o-ring (see kit B)	1
35	NSS	WASHER, back-up (inner) (see kit B)	2
A	031-3285-041	SEAL KIT (consists of items 3, 4)	A/R
B	031-2940-006	SEAL KIT (consists of items 30, 32 thru 35)	A/R
C	31-3285-26	SEAL KIT (consists of items 23 thru 27)	A/R

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TAILGATE (SECONDARY) VALVE
031-6269-002, -003, -004



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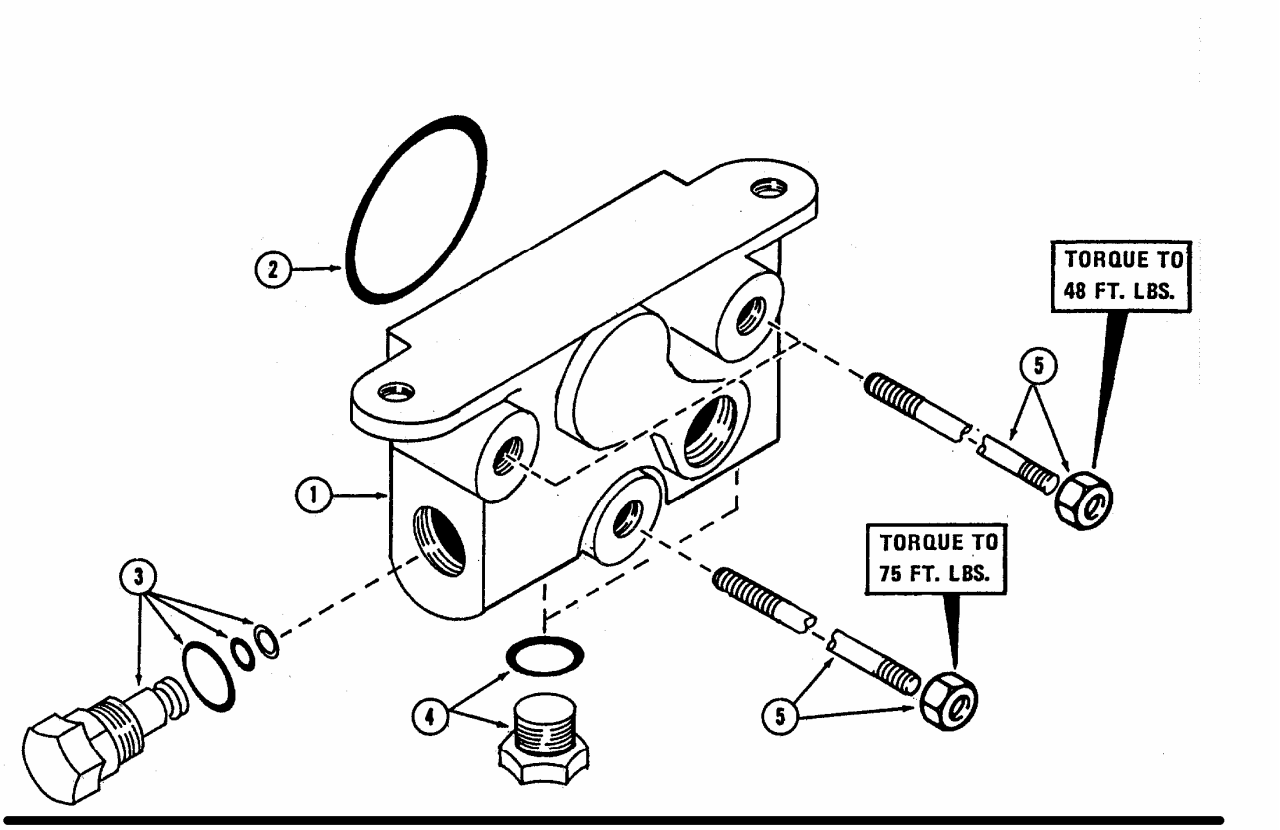
TAILGATE (SECONDARY) VALVE
031-6269-002, -003, -004

REF	PART NO.	DESCRIPTION	REQ'D
1	031-3245-009	SECTION, outlet (see page 5.34)	1
2	031-3245-005	SECTION, inlet (see page 5.34)	1
3	031-3245-007	SECTION, working (see page 5.36)	1
4	031-3544-006	SECTION, working (see page 5.38)	1
5	031-6267	SECTION, working (see page 5.41.2)	A/R

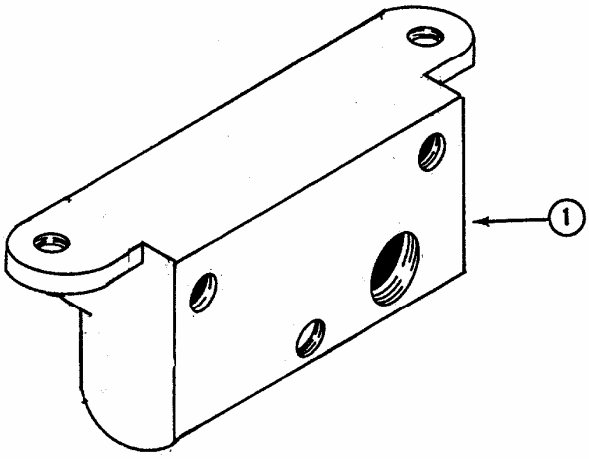
COMPLETE SECTIONED VALVES 031-6269-002, 003, 004
INCLUDE ALL ITEMS SHOWN ON PAGE 5.33.1 PLUS THE MOUNTING TIE RODS

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INLET SECTION with PLUGS and TIE RODS
031-3245-005



OUTLET SECTION
31-3245-09



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INLET SECTION with PLUGS and TIE RODS
031-3245-005

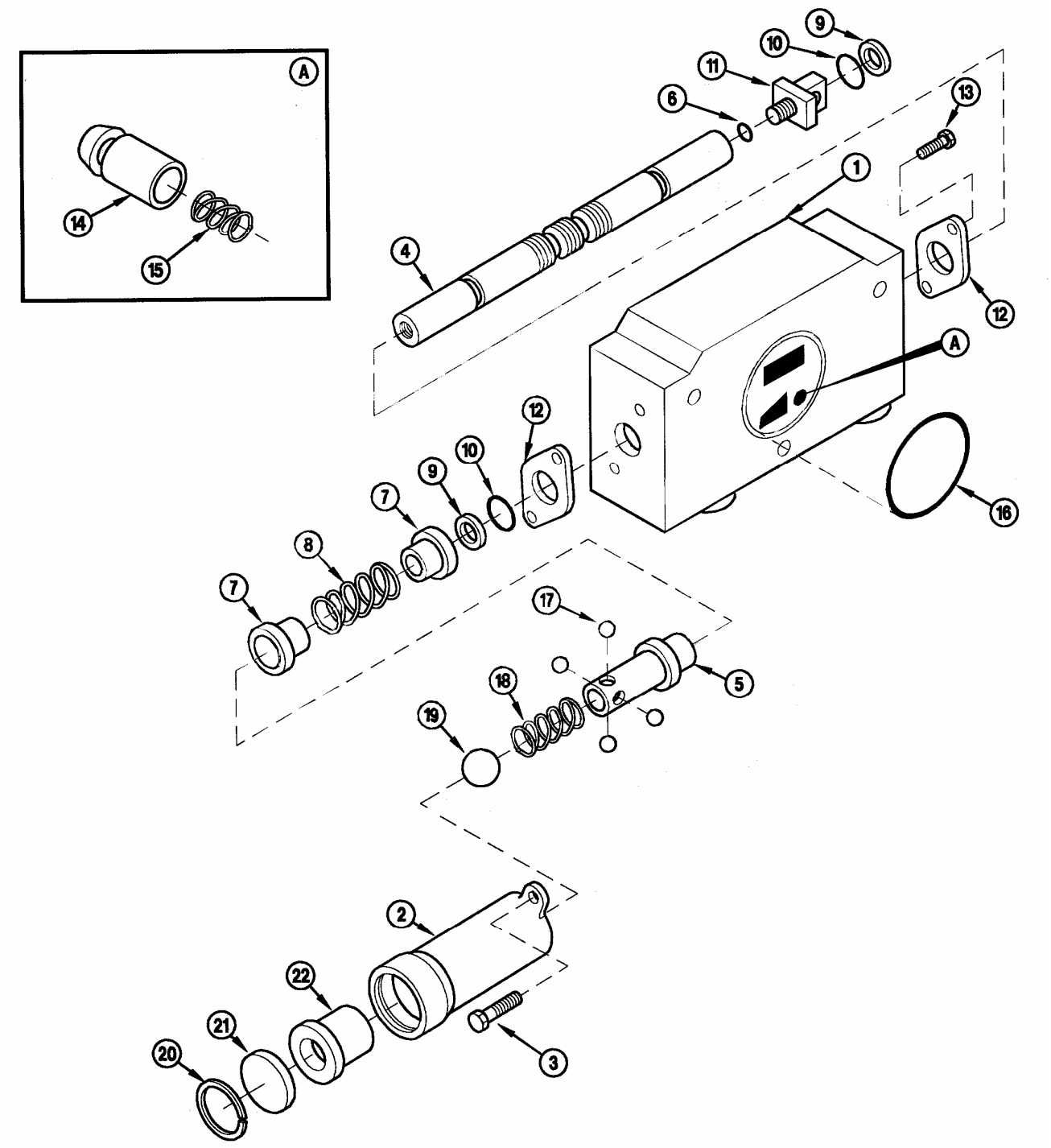
REF	PART NO.	DESCRIPTION	REQ'D
1	NSS	HOUSING (part of inlet section)	1
2	031-3245-010	O-RING (part of inlet section)	1
3	031-3271	PLUG, shut-off (includes o-ring)	1
4	031-2018-010	PLUG (includes o-ring)	2
5	027-4680	TIE ROD ASSEMBLY (includes rods and nuts) for 2-spool valve	1
	027-4678	TIE ROD ASSEMBLY (includes rods and nuts) for 3-spool valve	1
	027-4679	TIE ROD ASSEMBLY (includes rods and nuts) for 4-spool valve	1

OUTLET SECTION
031-3245-009

REF	PART NO.	DESCRIPTION	REQ'D
1	031-3245-009	OUTLET SECTION	1

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TAILGATE VALVE WORKING SECTION for UPPER PANEL FUNCTION
031-3245-007



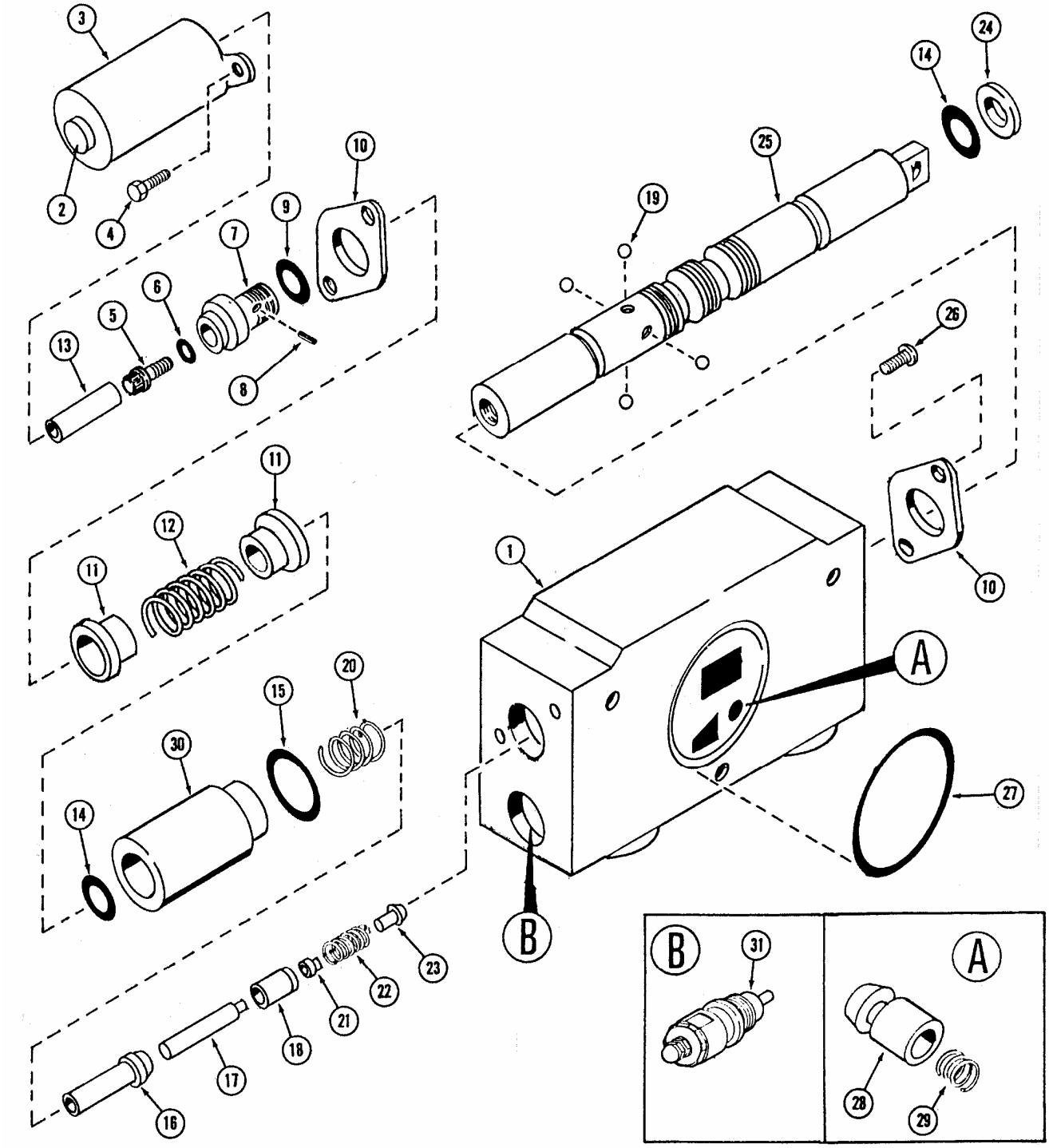
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TAILGATE VALVE WORKING SECTION for UPPER PANEL FUNCTION 031-3245-007

REF	PART NO.	DESCRIPTION	REQ'D
1	NSS	BODY	1
2	NSS	CAP, end	1
3	NSS	CAPSCREW	2
4	NSS	SPOOL – (see spool kit below)	1
5	NSS	PIN, spool end detent	1
6	NSS	O-RING	1
7	NSS	SEAT, spring	2
8	NSS	SPRING	1
9	NSS	WIPER	2
10	NSS	O-RING	2
11	031-3245-018	END, tang	1
12	NSS	PLATE, seal	2
13	031-2012-06	SCREW, machine	2
14	031-3245-016	POPPET	1
15	031-3245-014	SPRING	1
16	031-3245-010	O-RING	1
17	NSS	BALL	4
18	031-2928-003	SPRING	1
19	NSS	BALL	1
20	NSS	RING, retaining – internal	1
21	NSS	SPACER	1
22	NSS	SLEEVE, detent	1
-	272-3863	KIT, spool (consists of items 4 thru 9, 17 thru 19)	1
-	272-7888	KIT, end mechanism (consists of items 2, 3, 5, 7 thru 10, 12, 17, 19 thru 22)	1

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TAILGATE VALVE WORKING SECTION for BLADE FUNCTION
031-3544-006



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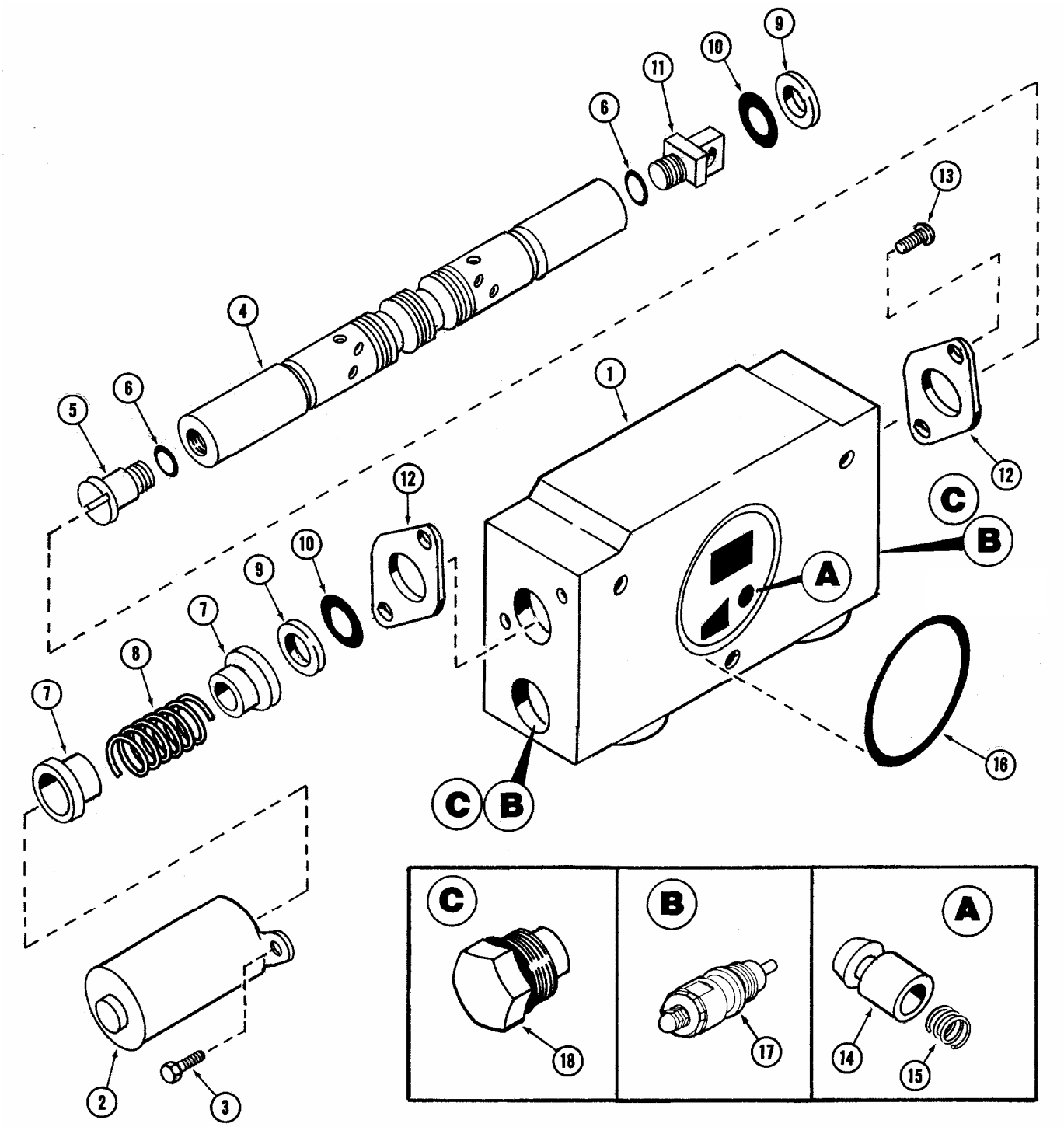
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TAILGATE VALVE WORKING SECTION for BLADE FUNCTION
031-3544-006

REF	PART NO.	DESCRIPTION	REQ'D
1	NSS	BODY	1
2	031-2012-013	PLUG	1
3	031-2012-012	CAP, spool	1
4	031-2012-015	CAPSCREW	2
5	NSS	SCREW, adjusting	1
6	NSS	O-RING	1
7	NSS	END, spool	1
8	NSS	INSERT, locking	1
9	NSS	O-RING	1
10	NSS	PLATE, seal	2
11	NSS	SEAT, spring	2
12	031-3544-007	SPRING	1
13	031-2012-016	SPACER	1
14	NSS	O-RING	2
15	NSS	O-RING	1
16	NSS	CAM, detent	1
17	NSS	ROD, adjusting	1
18	NSS	SLEEVE	1
19	NSS	BALL	4
20	NSS	SPRING	1
21	NSS	GUIDE, spring	1
22	NSS	SPRING	1
23	NSS	POPPET	1
24	NSS	WIPER	1
25	NSS	SPOOL (see kit)	1
26	031-2012-006	SCREW, machine	2
27	031-3245-010	O-RING	1
28	031-3245-016	POPPET	1
29	031-3245-014	SPRING	1
30	NSS	SLEEVE, detent	1
31	031-3245-008	VALVE, relief (set @ 3900 PSI)	1
-	272-3861	KIT, spool (consists of items 5 thru 11, 14 thru 25, 30)	1

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TAILGATE VALVE WORKING SECTION for ARM, WINCH, ROLL BAR or REEVING MECHANISM ON 031-6267



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TAILGATE VALVE WORKING SECTION for ARM, WINCH, ROLL BAR or REEVING MECHANISM ON 031-6267

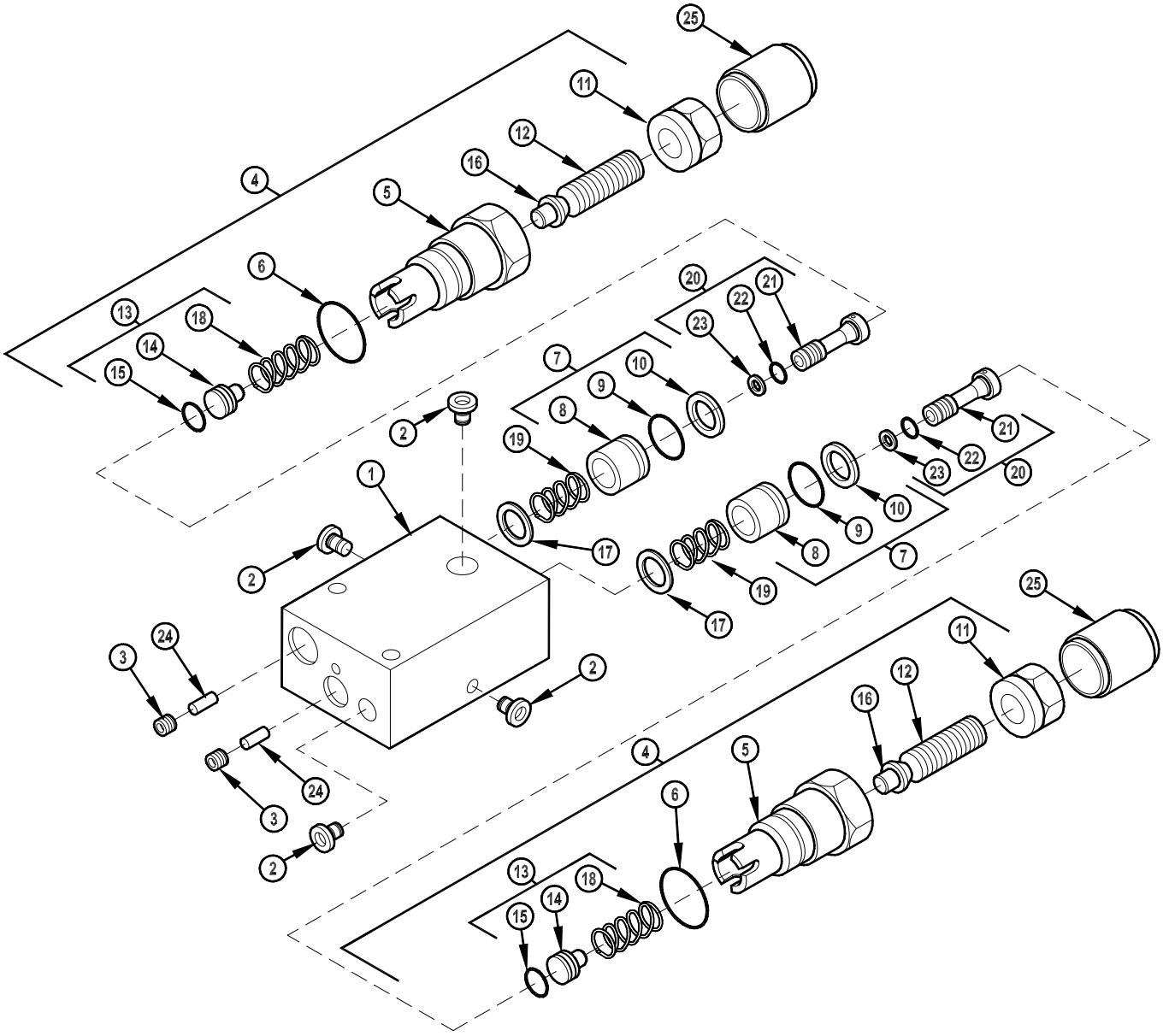
REF	PART NO.	DESCRIPTION	REQ'D
1	NSS	BODY	1
2	031-2012-003	CAP, spool	1
3	031-2012-005	CAPSCREW	2
4	NSS	SPOOL (see kit)	1
5	NSS	END, spool	1
6	NSS	O-RING	2
7	NSS	SEAT, spring	2
8	NSS	SPRING	1
9	NSS	WIPER	2
10	NSS	O-RING	2
11	NSS	END, tang	1
12	NSS	PLATE, seal	2
13	031-2012-006	SCREW, machine	2
14	031-3245-016	POPPET	1
15	031-3245-014	SPRING	1
16	031-3245-010	O-RING	1
17	031-3242	CARTRIDGE, relief – set @ 1400 PSI **(NOT PART OF SECTION)**	1
18	025-0472	PLUG	A/R
-	372-1434	SPOOL KIT (consists of items 4 thru 12)	1

UNITS WITH ROLL BAR, OR ARM MECHANISM USE 1 RELIEF (31-3242) AND 1 PLUG (25-0472)

UNITS WITH WINCH USE 2 RELIEFS (31-3242)

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EJECTOR UNLOAD VALVE (B/C)
031-6272



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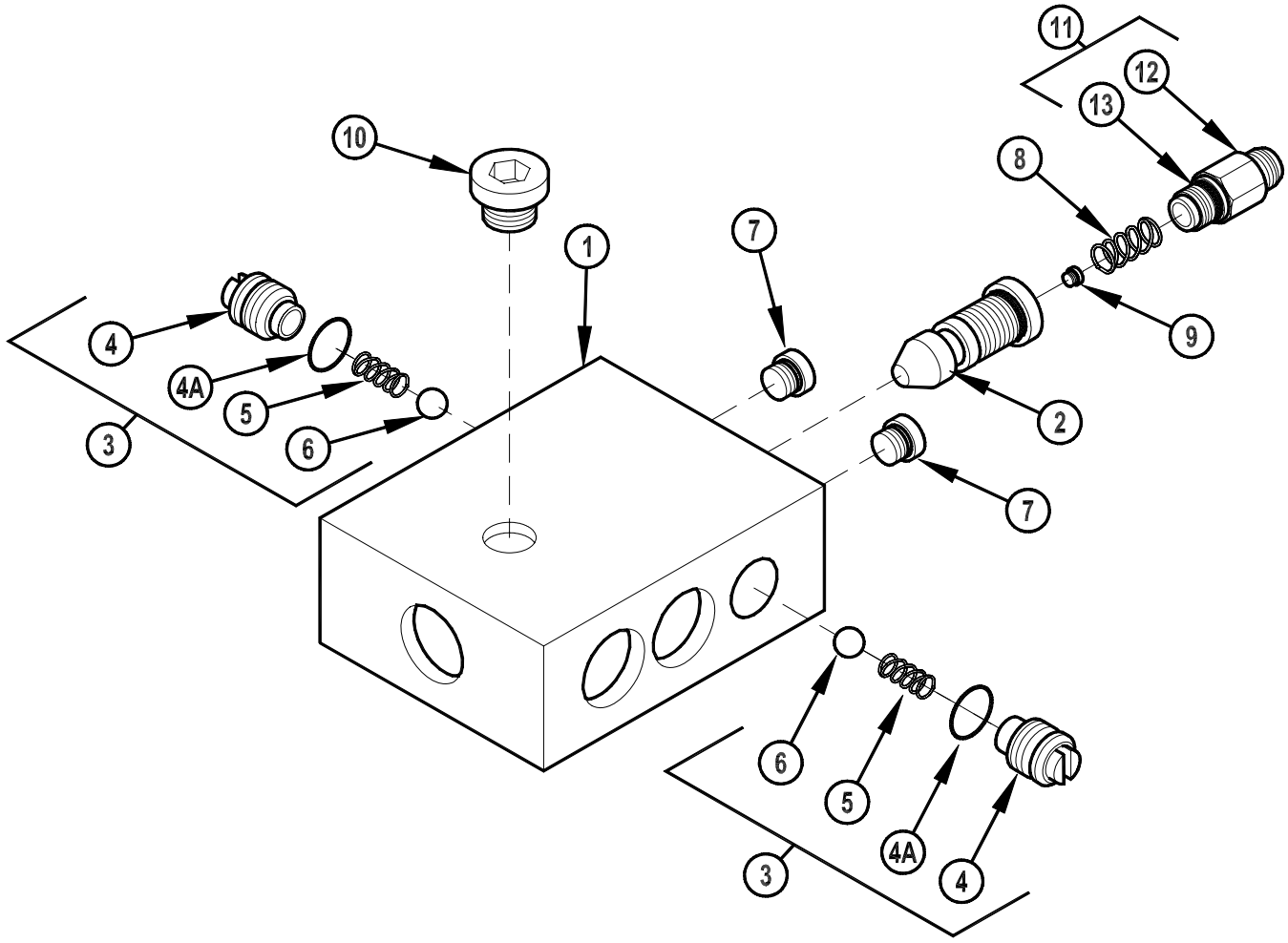
FORMULA 5000

EJECTOR UNLOAD VALVE (B/C)
031-6272

REF	PART NO.	DESCRIPTION	REQ'D
1	NSS	MANIFOLD	1
2	031-6272-002	PLUG – 1/8"	4
3	031-6272-003	PLUG, orifice – M6 x 6	2
4	031-6272-001	VALVE SUB ASSEMBLY	2
5	NSS	BODY	1
6	031-6272-007	O-RING	1
7	031-6272-008	SEAT SUB ASSEMBLY	1
8	NSS	SEAT	1
9	NSS	O-RING	1
10	NSS	RING, glide	1
11	031-6272-009	NUT, lock	1
12	031-6272-010	SCREW, adjusting	1
13	031-6272-011	SPRING GUIDE SUB ASSEMBLY	1
14	NSS	GUIDE, spring	1
15	NSS	O-RING	1
16	NSS	GUIDE, spring	1
17	NSS	SPACER	1
18	NSS	SPRING, main	1
19	031-6272-012	SPRING, check valve	1
20	031-6272-013	PISTON SUB-ASSEMBLY	1
21	NSS	PISTON	1
22	NSS	O-RING	1
23	NSS	O-RING	1
24	031-6272-004	PISTON, pilot	2
25	031-6272-005	CAP, tamper proof	2

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REGENERATIVE VALVE
031-6285



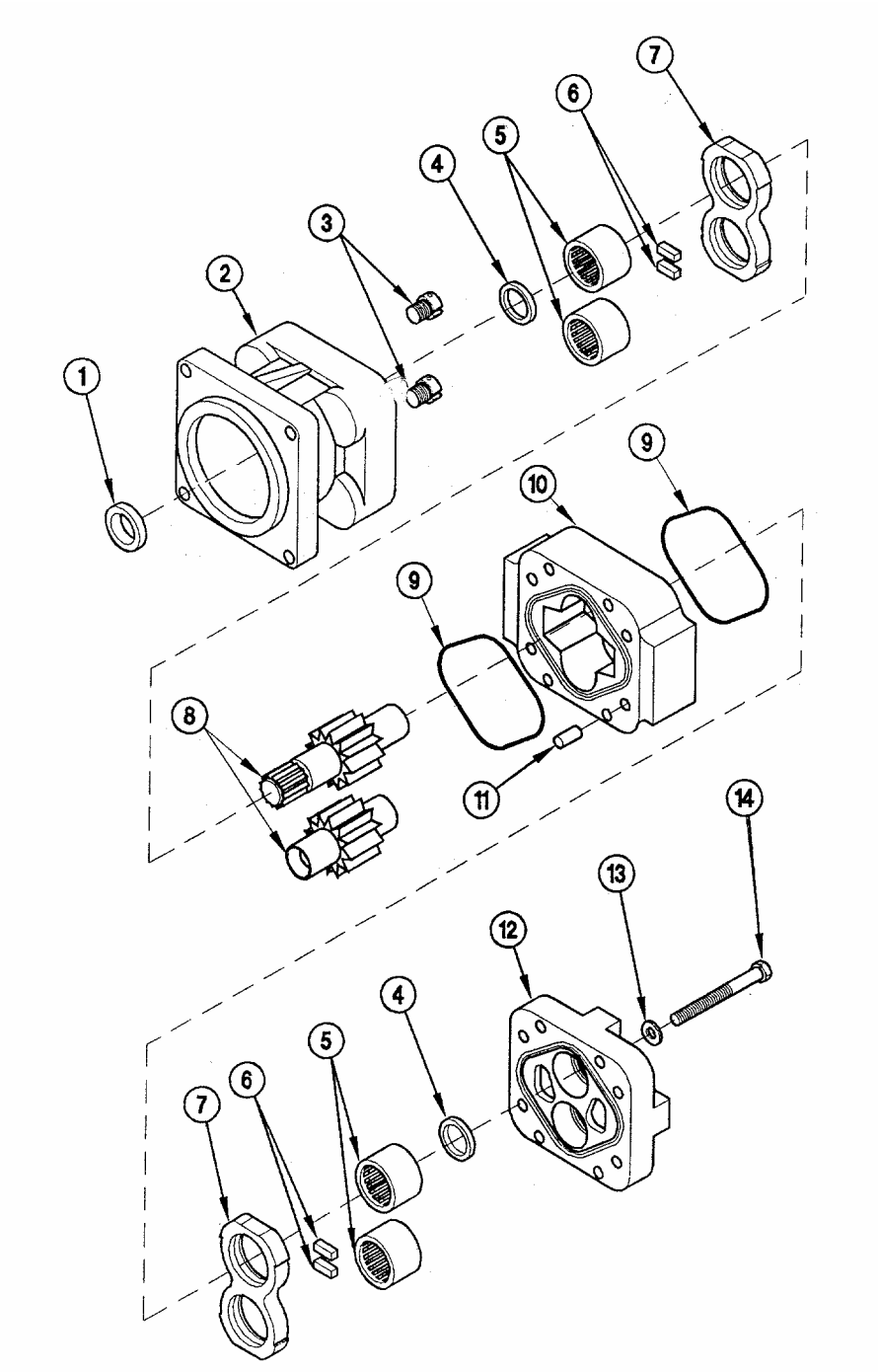
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REGENERATIVE VALVE
031-6285

REF	PART NO.	DESCRIPTION	REQ'D
1	NSS	MANIFOLD	1
2	031-6285-001	SPOOL	1
3	031-6285-002	VALVE, check	2
4	NSS	PLUG, retaining	1
4A	031-6285-008	O-RING	1
5	NSS	BALL	1
6	NSS	SPRING	1
7	031-6272-002	PLUG	2
8	031-6285-004	SPRING	1
9	031-6285-005	PLUG	1
10	031-2685-006	PLUG	1
11	031-6285-007	PLUG ASSEMBLY, retaining	1
12	NSS	PLUG	1
13	031-6285-009	O-RING	1

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HYDRAULICE PUMP – DIRECT MOUNT
219-1915



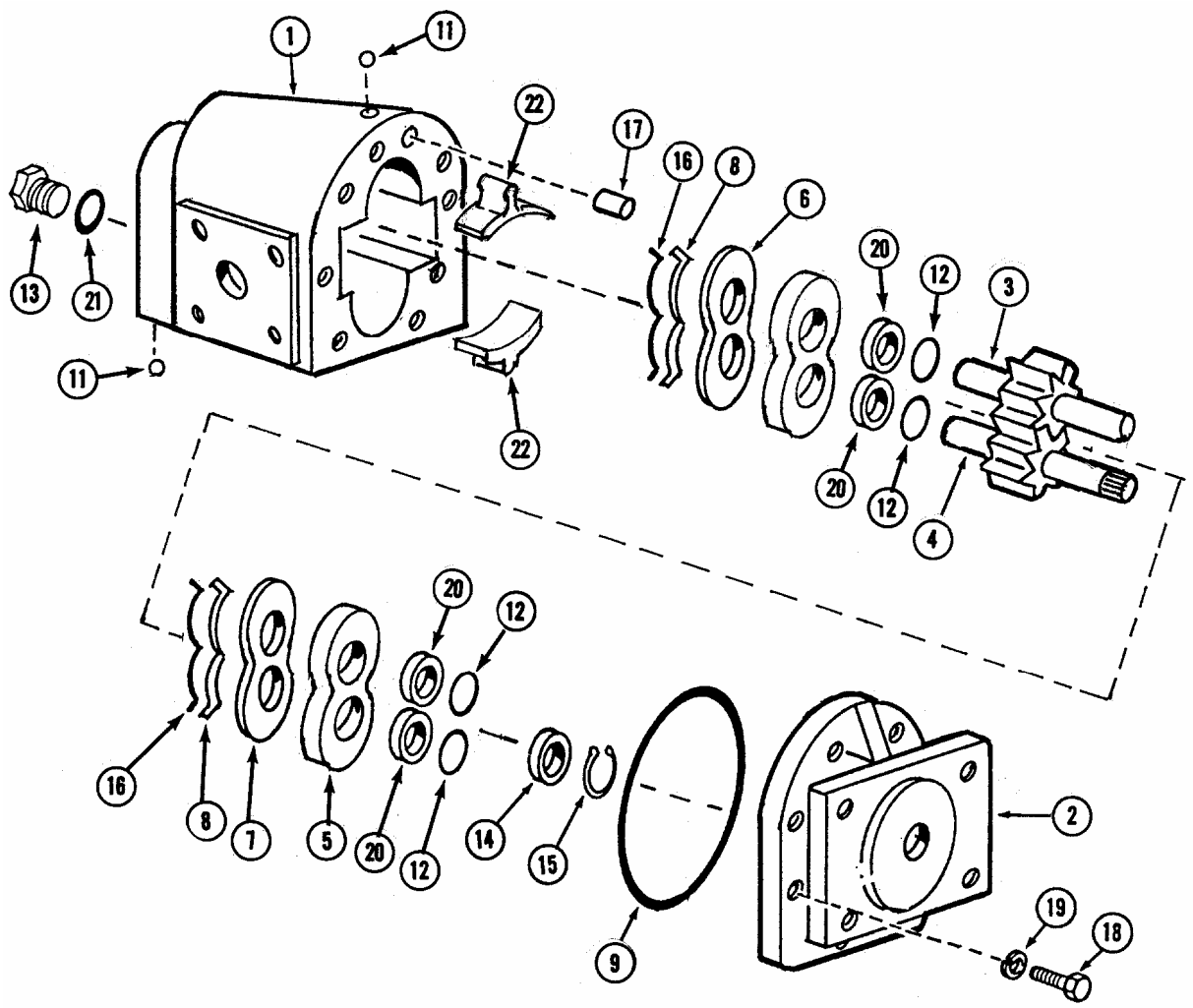
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HYDRAULICE PUMP – DIRECT MOUNT
219-1915

REF	PART NO.	DESCRIPTION	REQ'D
1	219-0915-004	SEAL, lip	1
2	219-1915-001	COVER, shaft end	1
3	219-1473-001	CHECK ASSEMBLY	2
4	219-0915-003	SEAL, ring	1
5	219-0915-002	BEARING, roller	4
6	219-0915-007	SEAL, pocket	12
7	219-0915-006	PLATE, thrust	2
8	219-1683-004	GEARS – matched set	1
9	219-0915-008	SEAL, gasket	2
10	219-1915-002	HOUSING, gear	1
11	219-1705-010	PIN, dowel	4
12	219-1915-003	COVER, port end	1
13	219-1683-007	WASHER	4
14	219-0915-011	CAPSCREW	4

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HYDRAULIC PUMP – DIRECT MOUNT
219-1458



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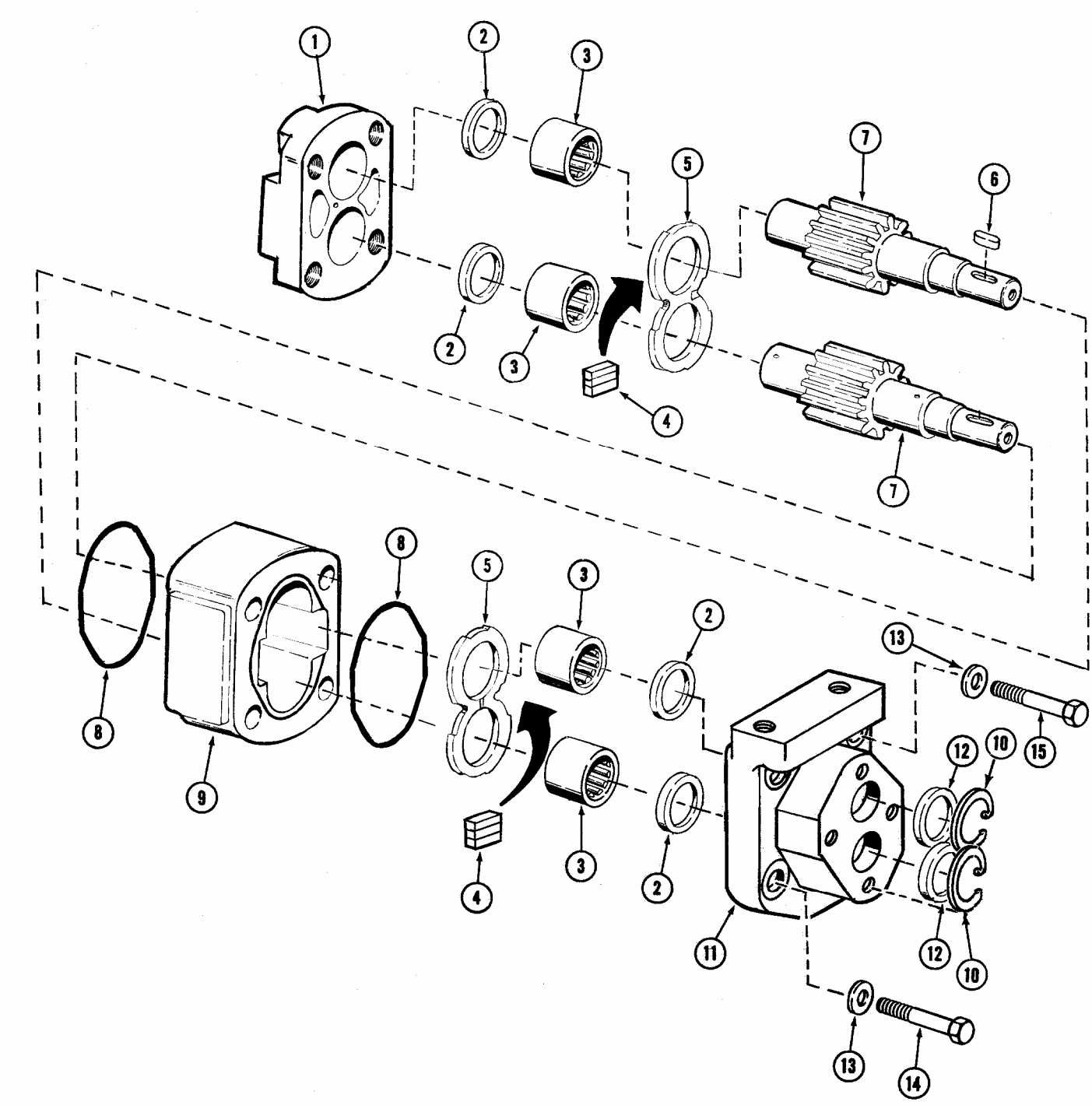
HYDRAULIC PUMP – DIRECT MOUNT
219-1458

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1458-008	BODY	1
2	219-1458-007	FLANGE	1
3	219-1452-002	GEAR, idler	1
4	219-1452-001	GEAR, drive	1
5	219-1458-006	PLATE, pressure	2
6	219-1458-014	PLATE, isolation – (top)	1
- 7	219-1458-002	PLATE, isolation – (bottom)	1
8	219-1458-012	SEPARATOR, center	2
9	NSS	O-RING	1
10	219-1458-003	RETAINER, ring	2
11	219-1452-008	BALL – 1/4"	2
12	NSS	O-RING	4
13	219-1458-005	PLUG	1
14	NSS	SEAL	1
15	NSS	RING, snap	1
16	NSS	STRIP, sealing	4
17	219-1665-019	DOWEL	2
18	219-1452-005	CAPSCREW	8
19	219-1665-021	WASHER	8
20	NSS	RING, back-up	4
21	NSS	O-RING	1
22	NSS	SEPARATOR, end	4

-	219-1458-001	KIT, shaft seal – (consists of items 9, 14, 15)	A/R
-	219-1458-017	KIT, seal repair – (consists of items 8, 9, 12, 14, 15,16, 20 thru 22)	A/R

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PTO MOUNT HYDRAULIC PUMP
219-1738 and 219-1748



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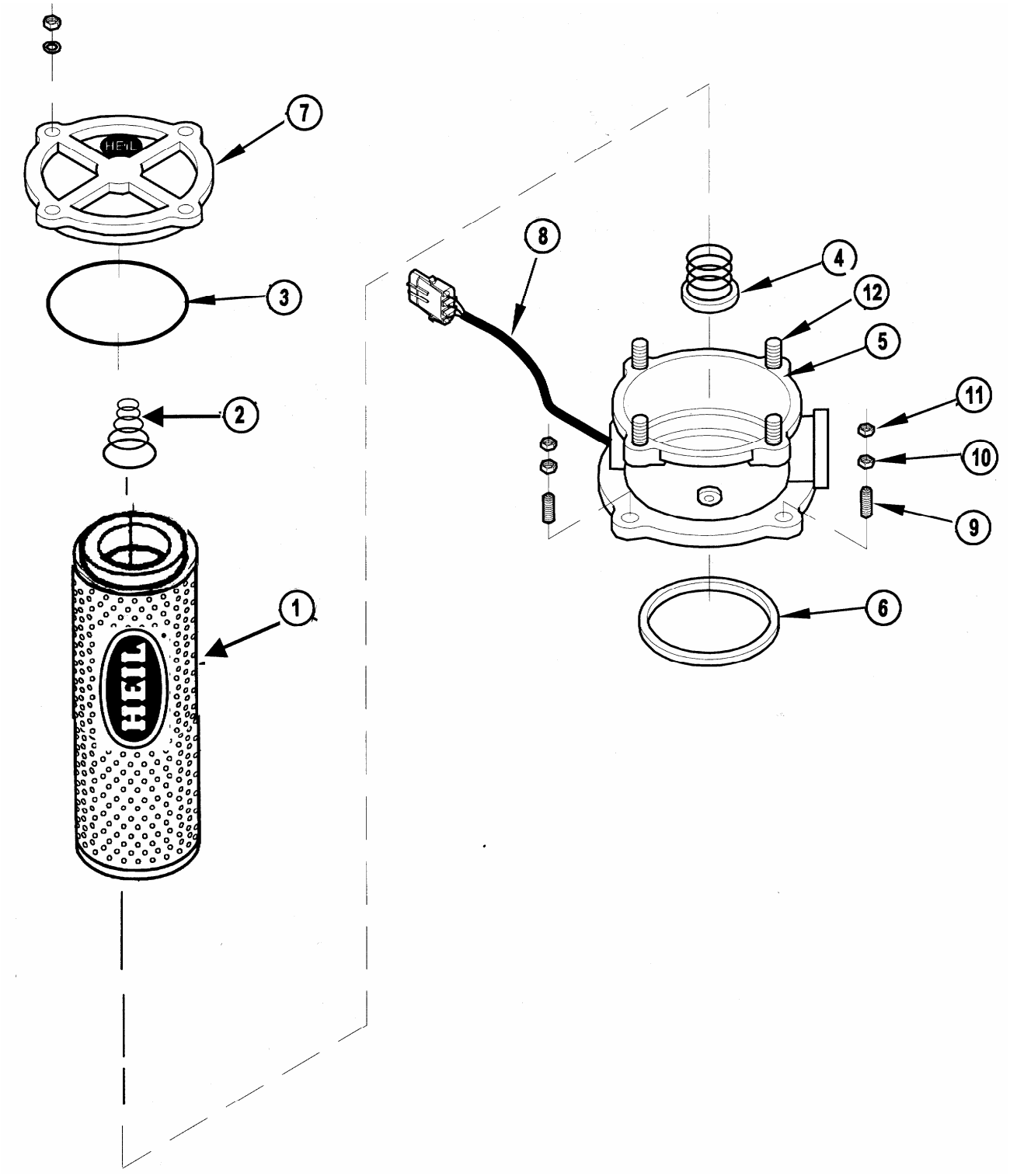
FORMULA 5000

PTO MOUNT HYDRAULIC PUMP
219-1738 and 219-1748

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1738-001	COVER, port end	1
2	219-0915-003	SEAL, ring	4
3	219-0915-002	BEARING, roller	4
4	219-1895-011	SEAL, pocket	12
5	219-1738-005	PLAE, thrust	2
6	219-1738-003	KEY	1
7	219-1738-004	SHAFT & GEAR – (matched set) for 219-1738 pump	1
	219-1748-002	SHAFT & GEAR – (matched set) for 219-1748 pump	1
8	219-0915-008	SEAL, gasket	1
9	219-1738-006	HOUSING, gear – 219-1738 pump	1
	219-1748-003	HOUSING, gear – 219-1748 pump	1
10	219-1738-012	RING, snap	2
11	219-1738-008	COVER, shaft end	1
12	219-1738-011	SEAL, lip	2
13	219-1473-021	WASHER	4
14	219-1473-020	CAPSCREW – for 219-1738 pump	2
	219-1474-003	CAPSCREW – for 219-1748 pump	2
15	219-1738-002	CAPSCREW – for 219-1738 pump	2
	219-1748-001	CAPSCREW – for 219-1748 pump	2

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IN-TANK OIL FILTER ASSEMBLY (3-MICRON)
075-0912



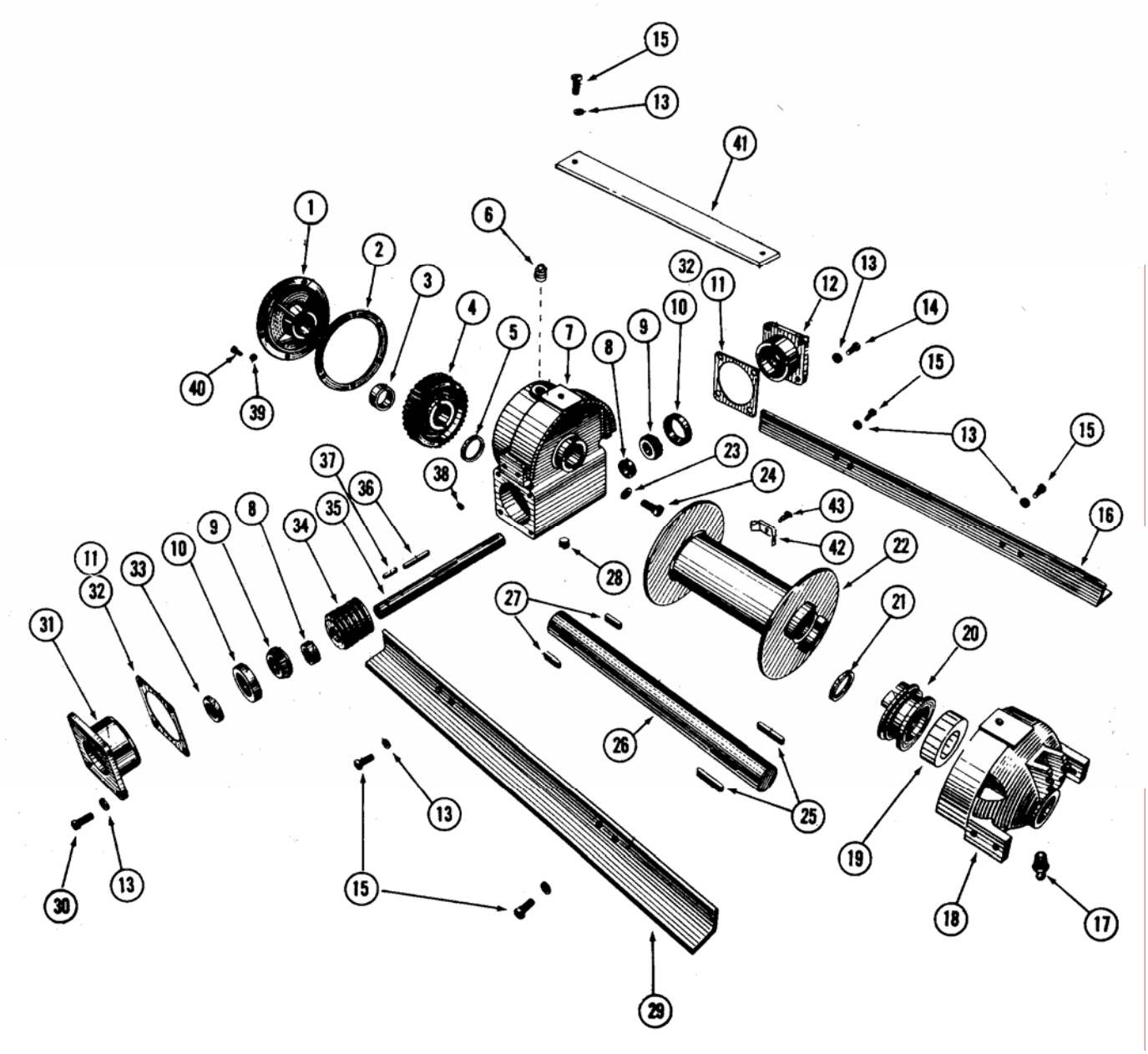
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IN-TANK OIL FILTER ASSEMBLY (3-MICRON)
075-0912

REF	PART NO.	DESCRIPTION	REQ'D
1	075-0912-030	ELEMENT, replacement filter (3 micron)	1
2	075-0912-004	SPRING (Part of Cover, item 7)	1
3	075-0912-003	O-RING, cover	1
4	NSS	BYPASS ASSEMBLY (Part of Element)	1
5	075-0711-009	HEAD	1
6	075-0711-010	GASKET, tank	1
7	075-0912-002	COVER (includes spring item 2)	1
8	075-0711-012	INDICATOR, electrical	1
9	047-2293-001	STUD – 3/8" double end	4
10	FS240900	NUT, lock – 3/8" – 24NF	4
11	FS270900	NUT, hex – 3/8" 24NF	4
12	075-0711-013	STUD	4

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12,000 LB. WINCH ASSEMBLY
253-1472



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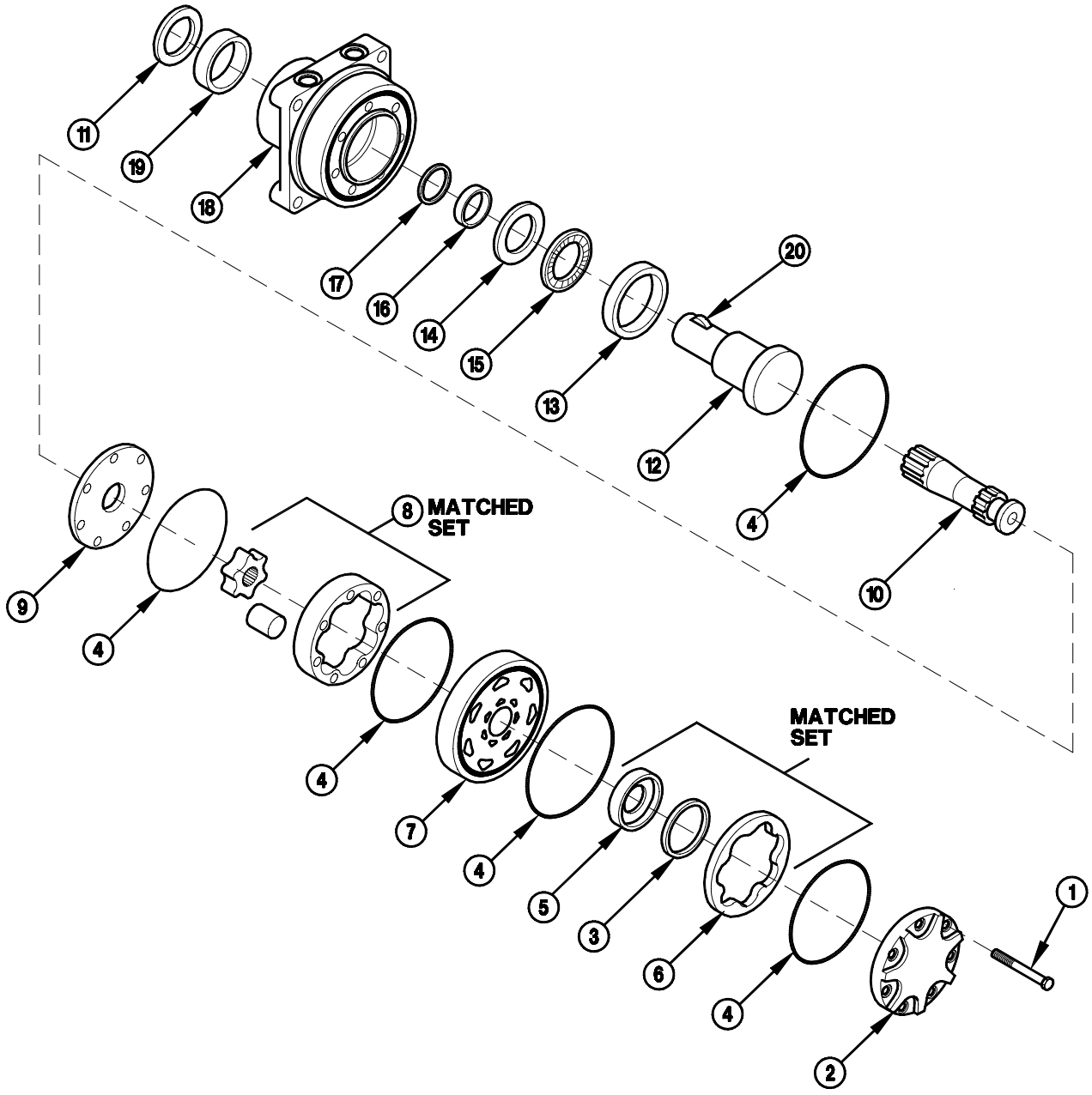
FORMULA 5000

12,000 LB. WINCH ASSEMBLY
253-1472

REF	PART NO.	DESCRIPTION	REQ'D
1	253-1472-001	COVER, housing	1
2	253-1472-002	GASKET	1
3	253-1472-003	RACE, thrust	1
4	253-1472-004	GEAR, worm	1
5	253-1472-005	RING, thrust	1
6	253-1472-006	PLUG, pipe	1
7	253-1472-007	HOUSING, worm	1
8	253-1472-008	SPACER, worm	2
9	253-1471-012	CONE, bearing	2
10	253-1471-014	CUP, bearing	2
11	253-1471-015	GASKET	3
12	253-1471-017	CONTAINER, bearing	1
13	253-1471-002	WASHER, lock	18
14	253-1471-049	CAPSCREW	4
15	253-1472-015	CAPSCREW	10
16	253-1472-016	ANGLE, base	1
17	253-1471-28	FITTING, grease	1
18	253-1471-27	LEG, bearing	1
19	253-1472-19	SPACER, clutch	1
20	253-1471-30	CLUTCH	1
21	253-1471-22	RING, retaining	1
22	253-1472-22	DRUM, cable	1
23	253-1472-23	WASHER, lock	2
24	253-1472-24	CAPSCREW	2
25	253-1471-13	KEY, clutch	2
26	253-1472-26	SHAFT, cable drum	1
27	253-1472-27	KEY, worm gear	2
28	253-1472-28	PLLUG, pipe	1
29	253-1472-29	ANGLE, base	1
30	253-1472-30	CAPSCREW	4
31	253-1471-42	CONTAINER, bearing	1
32	253-1471-16	GASKET	3
33	253-1471-44	SEAL, grease	1
34	253-1472-34	WORM	1
35	253-1471-41	SHAFT, worm	1
36	253-1471-40	KEY, worm	1
37	253-1471-43	KEY	1
38	253-1472-38	PLUG, pipe	1
39	253-1472-39	WASHER, lock	6
40	253-1472-40	CAPSCREW	6
41	253-1472-41	STRAP	1
42	253-1472-42	CLAMP, cable	1
43	253-1472-43	SCREW	1

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12,000 LB. WINCH MOTOR
219-1879



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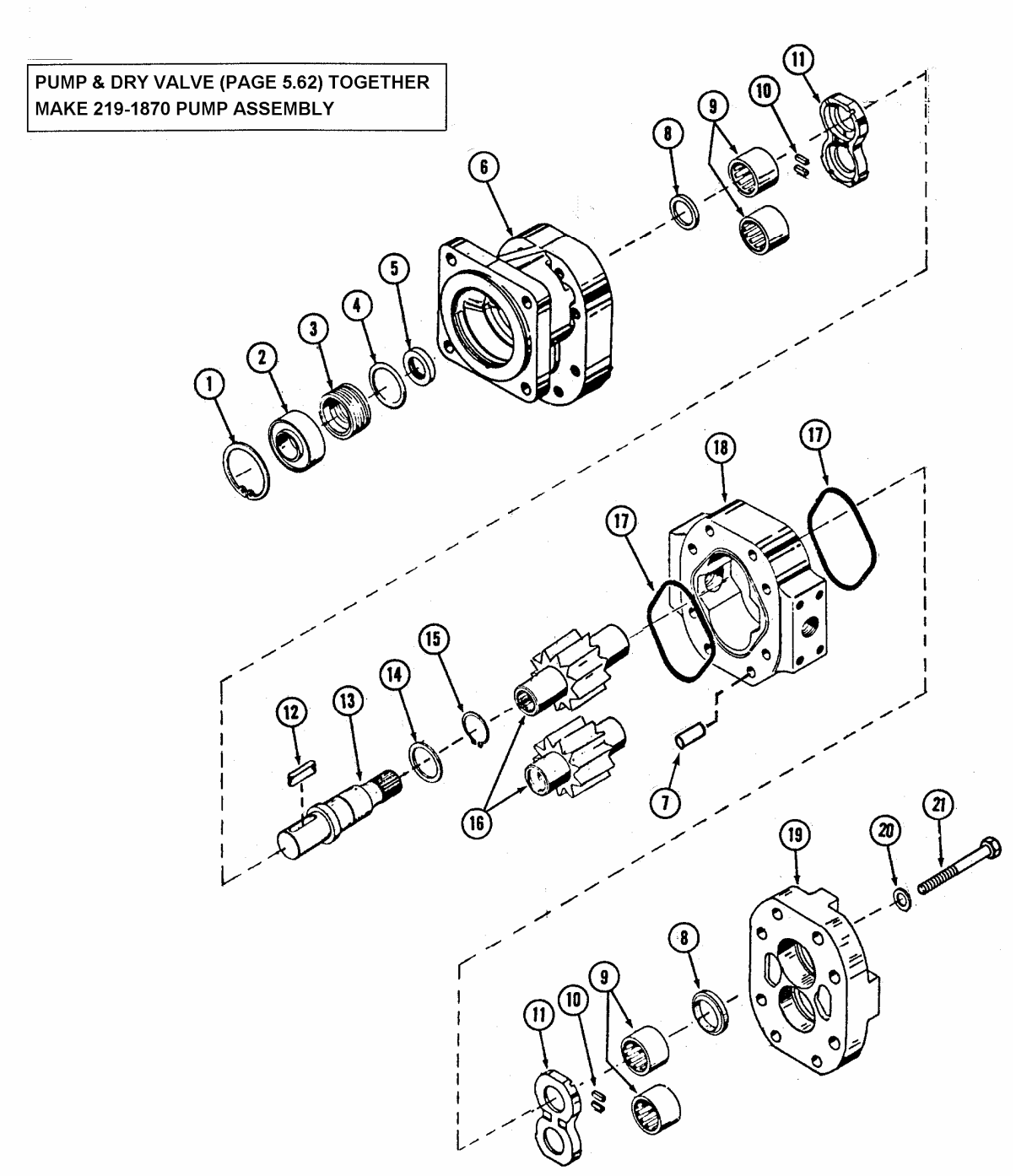
FORMULA 5000

12,000 LB. WINCH MOTOR
219-1879

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1879-001	BOLT	5
2	219-1878-002	COVER, end	1
3	NSS	SEAL, commutator	1
4	NSS	RING, seal	5
5	NSS	SEAL, inner	1
6	219-1878-003	COMMUTATOR & RING ASSEMBLY (matched set)	1
7	219-1878-007	MANIFOLD	1
8	219-1879-002	ROTOR SET	1
9	219-1878-009	PLATE, wear	1
10	219-1879-003	LINK, drive	1
11	NSS	SEAL, dirt & water	1
12	219-1878-011	SHAFT, coupling	1
13	NSS	BUSHING, bronze	1
14	219-1878-014	WASHER, thrust	1
15	219-1878-015	BEARING, thrust	1
16	NSS	SEAL, shaft	1
17	219-1878-016	RING, back-up	1
18	219-1878-017	HOUSING – (includes items 11 & 13)	1
19	219-1878-018	BEARING, "DU"	1
20	219-1878-012	KEY	1
21	NSS	PACK, grease – (not shown)	1
-	219-1878-021	SEAL KIT – (consists of items 3, 4, 5,11, 13, 21)	1

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HYDRAULIC PUMP
219-1870-001



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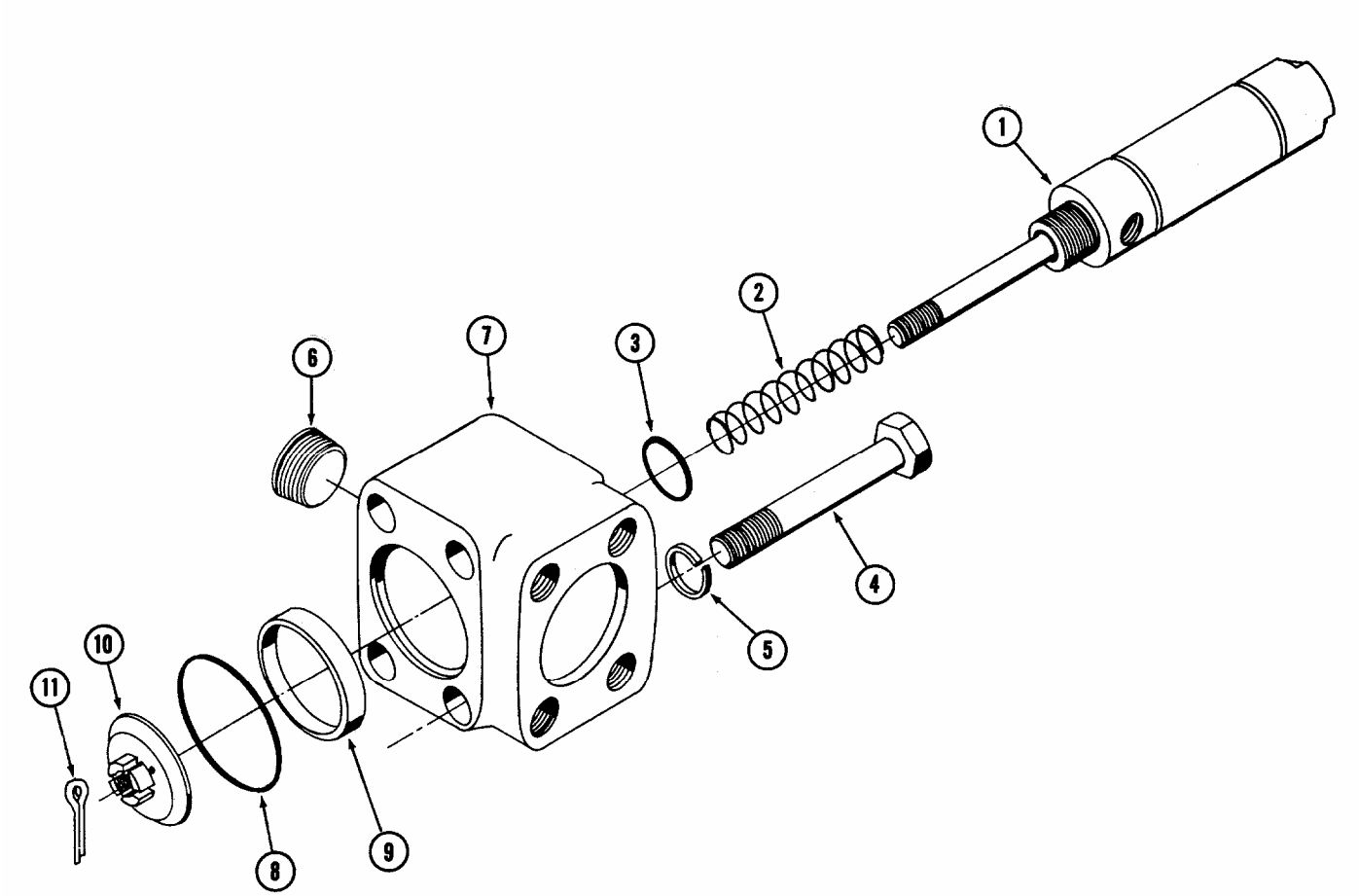
FORMULA 5000

HYDRAULIC PUMP
219-1870-001

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1473-002	RING, snap	1
2	219-1473-008	RING, bearing retainer	1
3	219-1473-003	RETAINER, seal	1
4	219-1473-005	O-RING	1
5	219-1684-008	SEAL	1
6	219-1870-002	COVER, shaft end	1
7	219-1684-011	PIN, dowel	4
8	219-1870-005	SEAL, ring	2
9	219-1473-007	BEARING, roller	4
10	219-1870-007	SEAL, pocket	12
11	219-1870-006	PLATE, thrust	2
12	219-1473-014	KEY	1
13	219-1473-017	SHAFT	1
14	219-1473-015	SPACER	1
15	219-1473-016	RING, retaining	1
16	219-1870-003	GEARS	1
17	219-1473-011	SEAL, gasket	2
18	219-1870-004	HOUSING, gear	1
19	219-1870-008	COVER, port end	1
20	219-1473-021	WASHER	8
21	219-1742-004	CAPSCREW	8
22	219-1870-009	PLUG	1

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POWER MISER VALVE
031-3241



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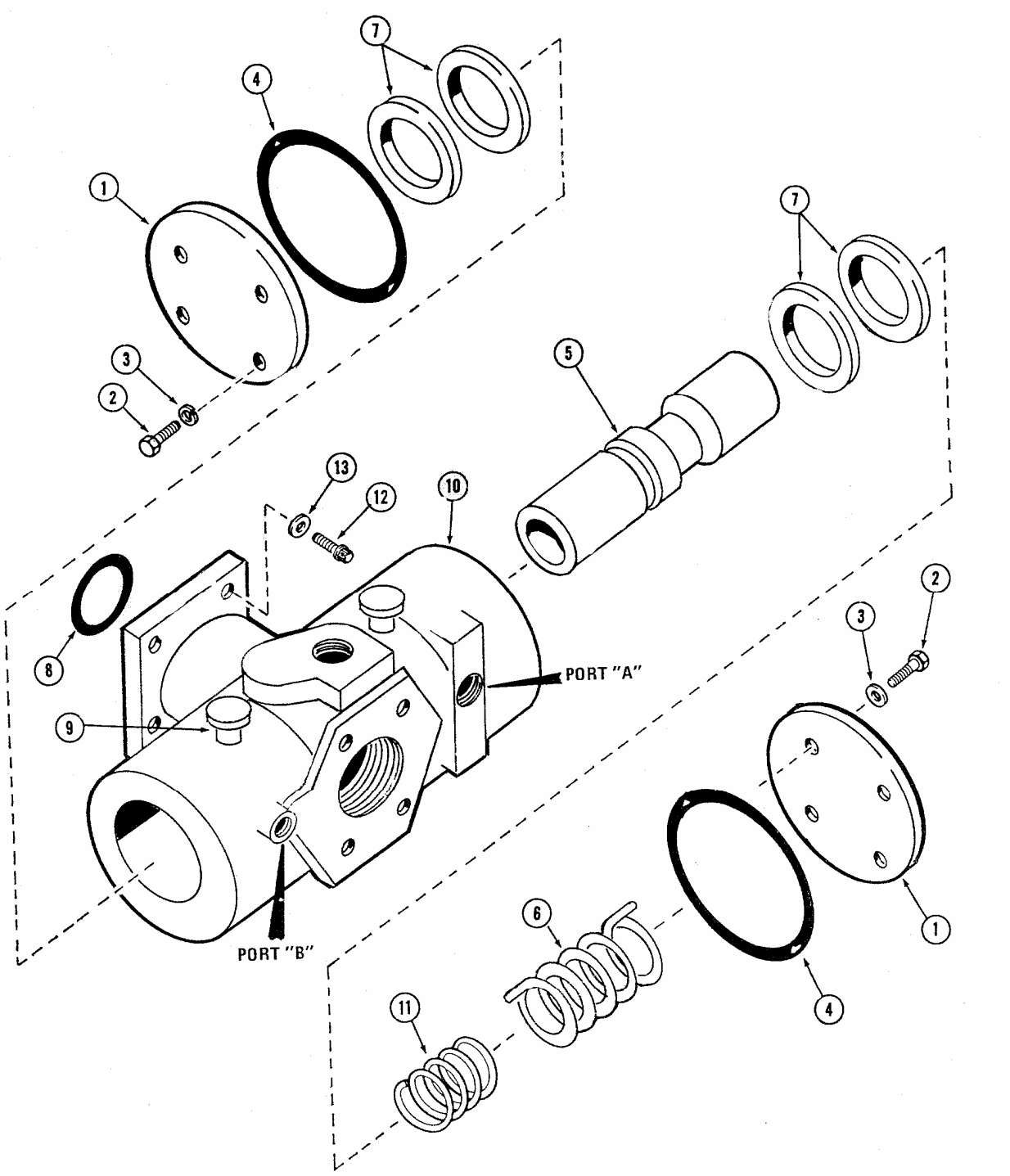
FORMULA 5000

POWER MISER VALVE
031-3241

REF	PART NO.	DESCRIPTION	REQ'D
1	031-29770-01	CYLINDER, air	1
2	031-2977-002	SPRING	1
3	031-2977-003	O-RING	1
4	031-2977-004	BOLT, mounting	4
5	031-2977-005	WASHER, lock	4
6	031-2977-006	PLUG, pipe	1
7	NSS	BODY	1
8	031-3241-001	O-RING	1
9	031-3241-002	RACE	1
10	031-3241-003	PLUNGER	1

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DRY VALVE
031-3230



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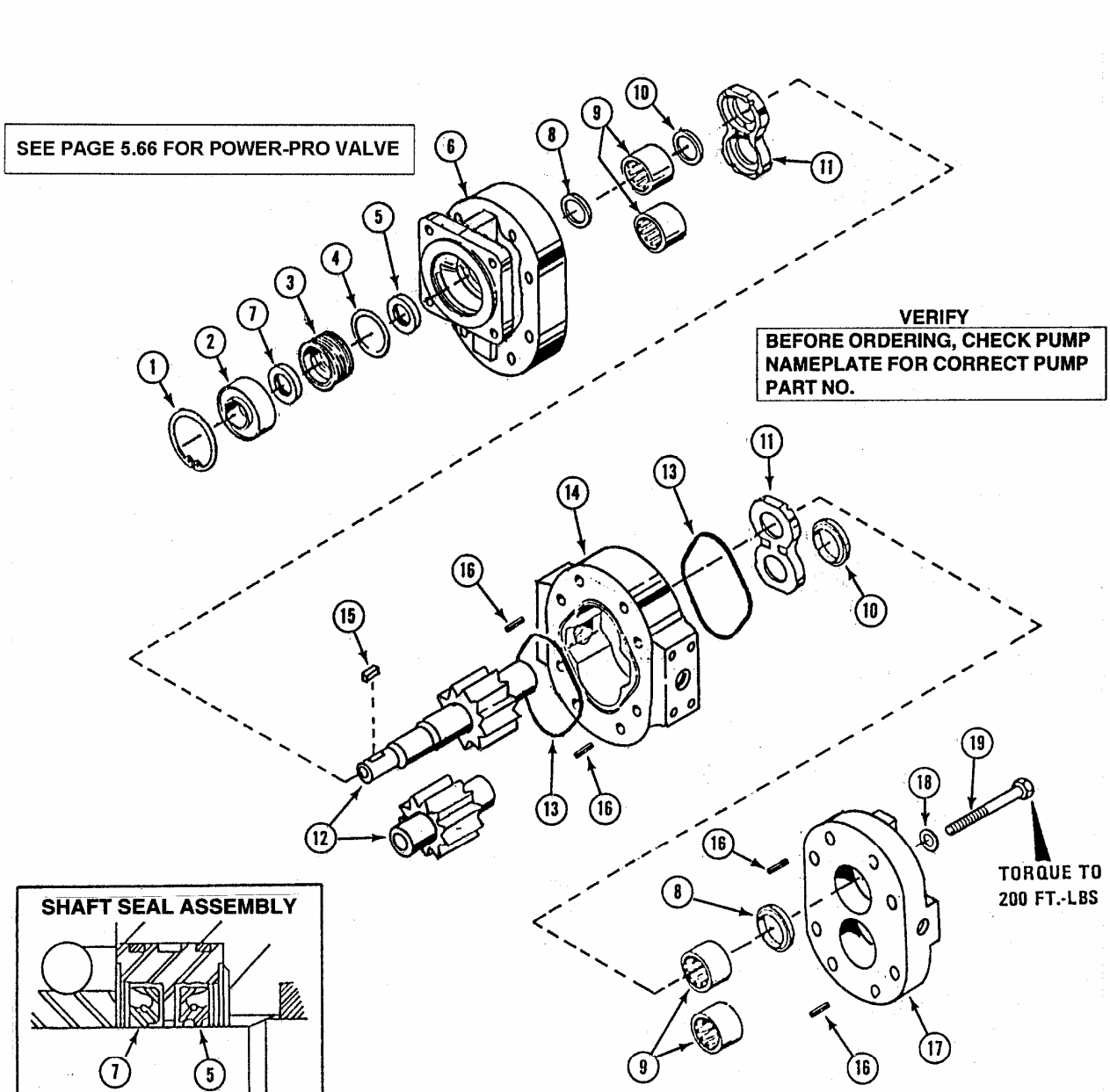
FORMULA 5000

DRY VALVE
031-3230

REF	PART NO.	DESCRIPTION	REQ'D
1	031-3230-002	PLATE, end	2
2	031-3230-004	BOLT – 5/16" – 18NC x 1-1/4"	8
3	031-3230-005	WASHER, lock – (hi collar) – 5/16"	8
4	031-3230-003	O-RING	2
5	NSS	SPOOL	1
6	031-3230-007	SPRING	1
7	031-3230-008	SEAL, o-ring	4
8	031-3230-009	O-RING	1
9	031-3230-010	VENT, air	2
10	NSS	HOUSING	1
11	031-3230-011	SPRING	1
12	031-3230-012	CAPSCREW	4
13	031-3230-013	WASHER, lock	4

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FRONT MOUNT PUMP
219-1893



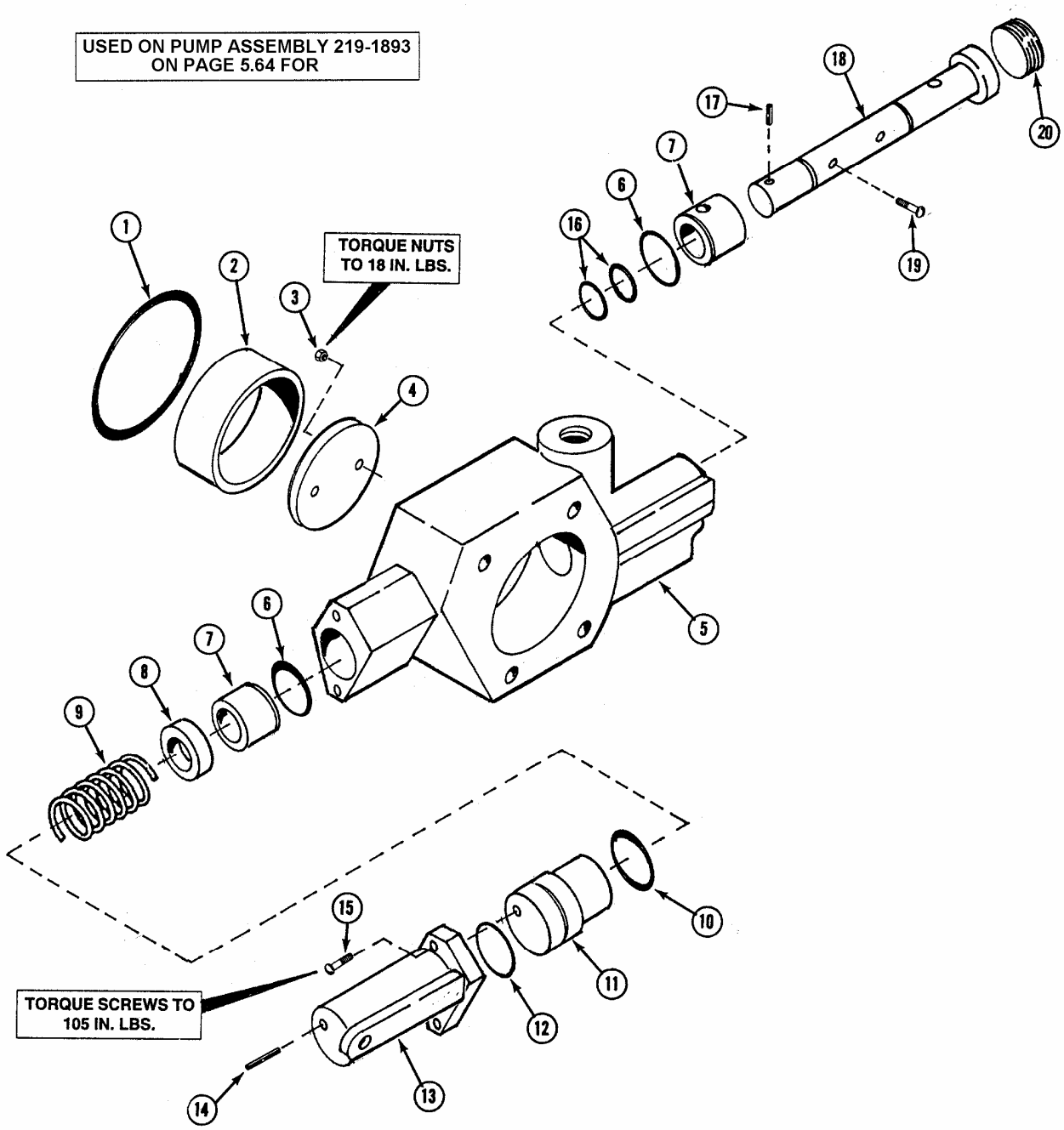
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FRONT MOUNT PUMP
219-1893

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1473-002	RING, snap	1
2	219-1473-008	BEARING, outboard	1
3	219-1684-007	RETAINER, seal	1
4	219-1473-005	O-RING, retainer	1
5	219-1684-008	SEAL, inside shaft	1
6	219-1684-001	COVER, front	1
7	219-1684-009	SEAL, outside shaft	1
8	219-1473-006	SEAL, ring	2
9	219-1473-007	BEARING	4
10	219-1684-014	SEAL, pressure balance	4
11	219-1473-013	PLATE, wear	2
12	219-1684-003	GEAR SET	1
13	219-1473-011	SEAL, gasket	2
14	219-1684-004	BODY – (mach. inlet)	1
15	219-1473-014	KEY	1
16	219-1684-011	PIN, dowel	4
17	219-1684-002	COVER, rear	1
18	219-1473-021	WASHER, lock	8
19	219-1684-013	CAPSCREW	8
20	219-1684-010	PLUG	2

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POWR-PRO VALVE for 219-1893 PUMP
031-5736-050



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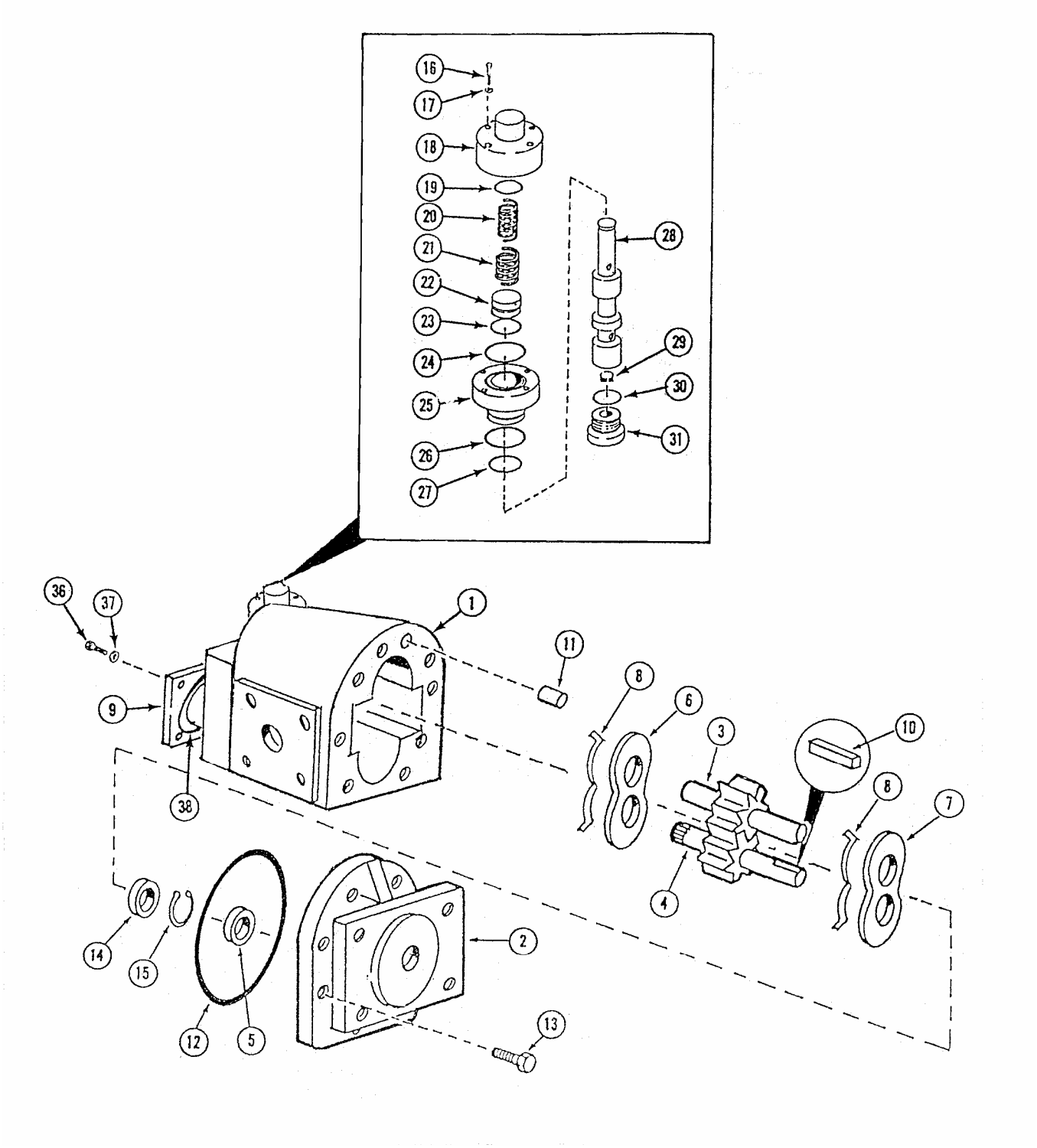
FORMULA 5000

POWR-PRO VALVE for 219-1893 PUMP
031-5736-050

REF	PART NO.	DESCRIPTION	REQ'D
1	NSS	O-RING, flange	1
2	031-5736-018	RACE	1
3	031-5736-017	LOCKNUT	2
4	031-5736-020	PLATE, throttle	1
5	031-5736-001	BODY, valve	1
6	NSS	O-RING, insert	2
7	031-5736-004	BUSHING, insert	2
8	031-5736-005	COLLAR, locking	1
9	031-5736007	SPRING	1
10	NSS	O-RING, piston	1
11	031-5736-010	PISTON	1
12	NSS	O-RING, air cup	1
13	031-5736-008	CUP, air	1
14	031-5736-011	PIN, dowel – (long)	1
15	031-5736-012	SCREW, air cup	2
16	NSS	O-RING, spool	2
17	031-5736-006	PIN, dowel – (short)	1
18	031-5736-003	SPOOL	1
19	031-5736-016	SCREW	2
20	031-5736-002	PLUG	1
-	031-5736-021	KIT, seal – (consists of items 1, 10, 6, 12, 16)……..A/R	

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FRONT MOUNT (HOC) HYDRAULIC PUMP
219-1995



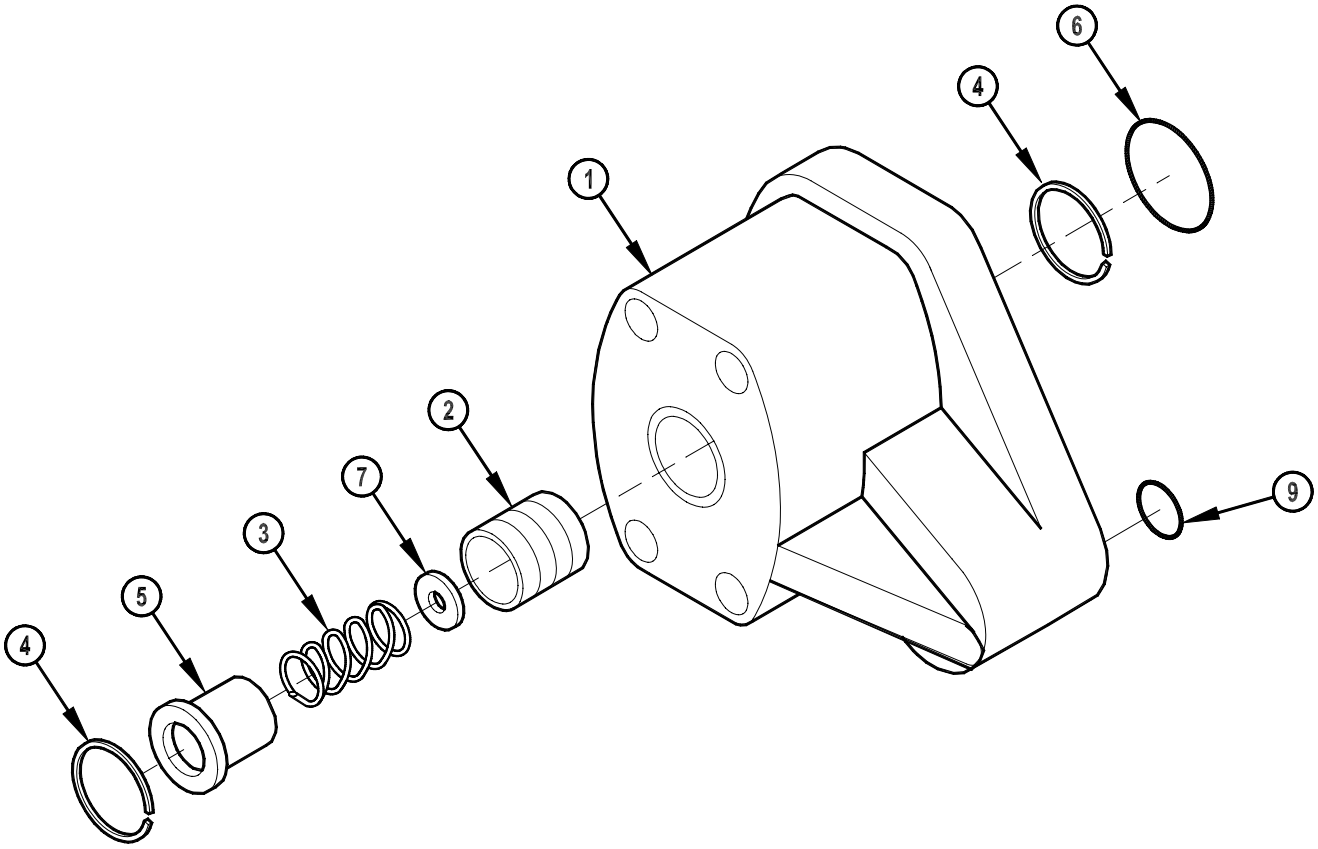
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FRONT MOUNT (HOC) HYDRAULIC PUMP
219-1995

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1995-001	BODY	1
2	219-1884-014	FLANGE	1
3	219-1995-004	GEAR, idler	1
4	219-1995-003	GEAR, drive	1
5	NSS	SEAL	1
6	219-1995-005	PLATE, pressure – (top)	1
7	219-1995-006	PLATE, pressure – (bottom)	1
8	NSS	RING, back-up	2
9	219-1894-012	PLATE, cover	1
10	219-1665-018	KEY	1
11	219-1665-019	DOWEL	2
12	NSS	SEAL, gasket	1
13	219-1884-020	CAPSCREW – 1/2" – 13NC x 1-1/2"	8
14	NSS	SEAL	1
15	NSS	RING, snap	1
16	219-1884-036	CAPSCREW – 1/4" – 20NC x 2-3/4"	4
17	219-1884-035	WASHER	4
18	219-1884-024	CAP, valve	1
19	NSS	O-RING	1
20	219-1884-028	SPRING	1
21	219-1884-037	SPRING	1
22	219-1884-026	PISTON, air	1
23	NSS	O-RING	1
24	NSS	O-RING	1
25	219-1884-023	BLOCK, valve	1
26	NSS	O-RING	1
27	NSS	O-RING	1
28	219-1884-025	SPOOL, valve	1
29	219-1665-013	PLUG, pipe – 1/8" – 27NPT	1
30	NSS	O-RING	1
31	219-1884-027	PLUG	1
32	219-1884-038	PLUG	1
33	NSS	O-RING	1
34	219-1884-044	PLUG	1
35	219-1884-045	O-RING	1
36	219-1894-013	CAPSCREW	4
37	219-1665-041	WASHER	4
38	NSS	O-RING	1
-	219-1894-16	KIT, shaft seal – (consists of items 5, 12, 14, 5)…….A/R	
-	219-1894-15	KIT, seal repair – (consists of items 5, 8, 12, 14, 15, 19, 23, 24, 26, 27, 30, 33, 38)…….A/R	

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FLOW REGULATOR for 219-1995 PUMP
219-1995-002



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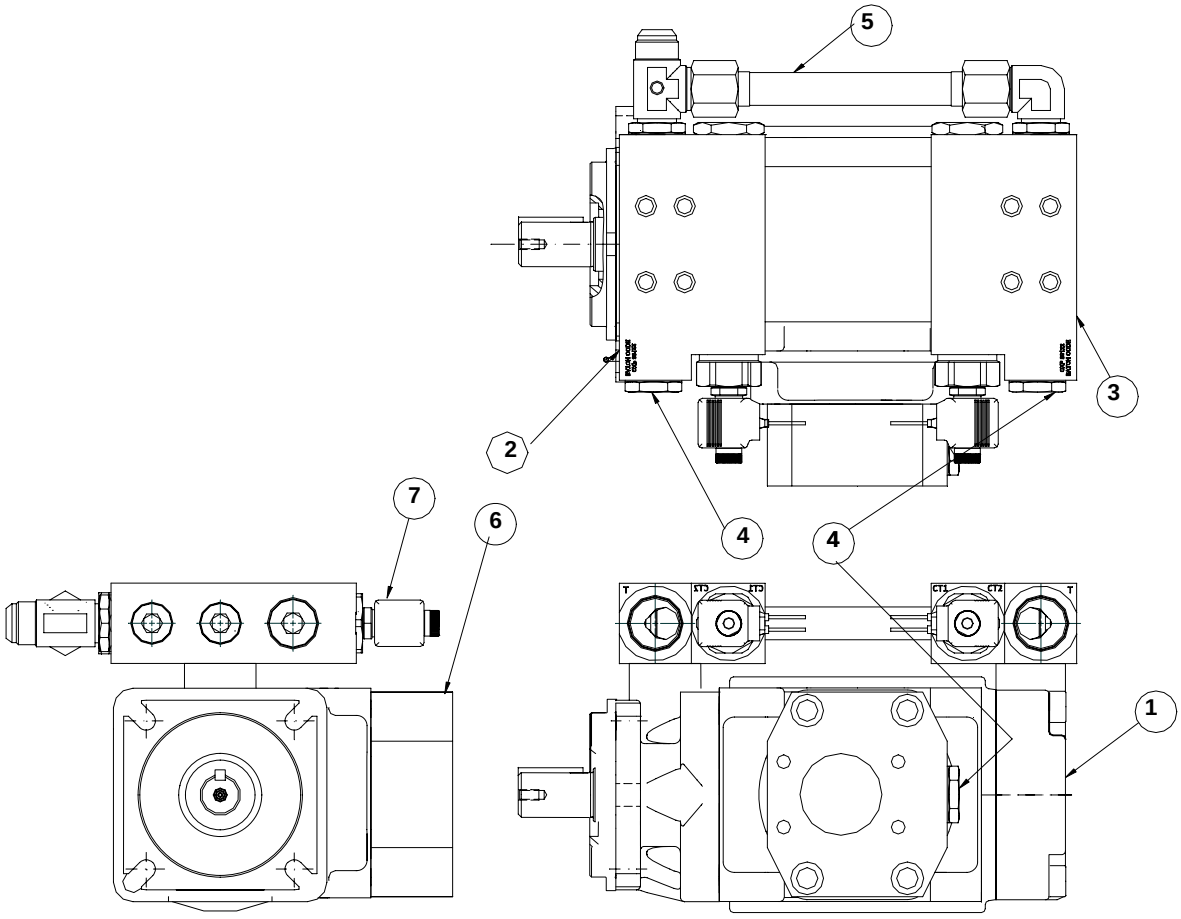
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FLOW REGULATOR for 219-1995 PUMP
219-1995-002

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1995-017	HOUSING	1
2	219-1995-018	SPOOL	1
3	219-1995-019	SPRING	1
4	219-1995-026	RING, snap	2
5	219-1995-020	POT, dasher	1
6	219-1995-021	O-RING	1
7	219-1995-022	WASHER – orifice	1
8	219-1995-023	CAPSCREW – 7/16" – 14NC x 3-3/4"	4
9	219-1995-024	O-RING	1
10	219-1995-025	CAPSCREW – 7/16" – 14NC x 3"	2

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TANDEM VANE PUMP ASSEMBLY (Operate-At-Idle)
Front Mount - 219-2269
PTO Mount – 219-2271



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TANDEM VANE PUMP ASSEMBLY (Operate-At-Idle)
Front Mount - 219-2269
PTO Mount – 219-2271

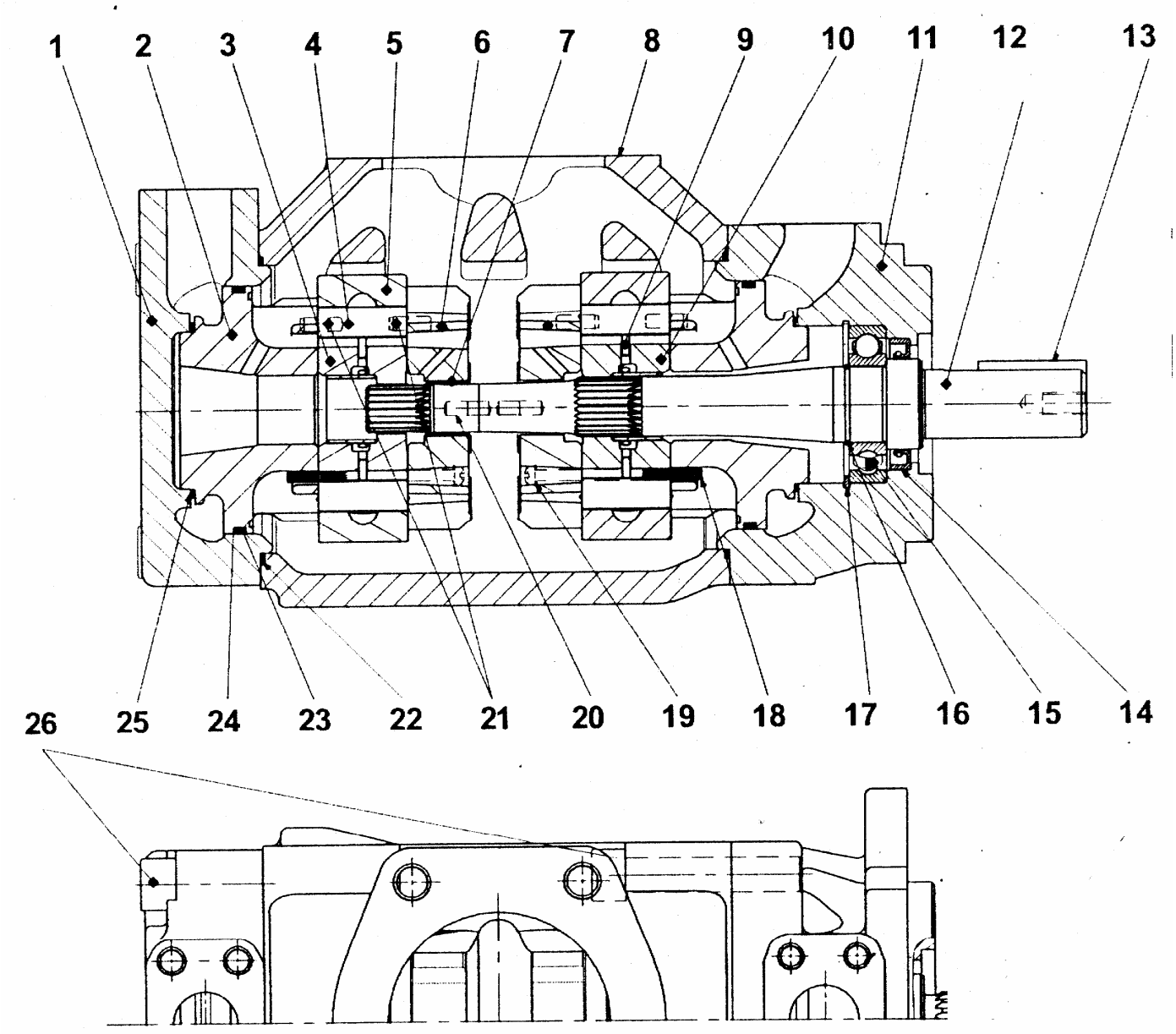
REF	PART NO.	DESCRIPTION	REQ'D
1	219-2269-001	PUMP ONLY (see page 5.75)	1
	219-2271-001	PUMP ONLY (see page 5.75)	1
2	219-2260-002	VALVE, front unload	1
3	219-2260-003	VALVE, rear unload	1
4	219-2260-004	ADAPTER	3
5	219-2260-005	TUBE, combined flow with fittings	1
6	219-2260-006	BLOCK, inlet	1
7	219-2260-007	COIL	2

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TANDEM VANE PUMP ONLY (Keyed Shaft)
Front Mount - 219-2269-001 (CCW Rotation)
PTO Mount – 219-2271-001 (CW Rotation)



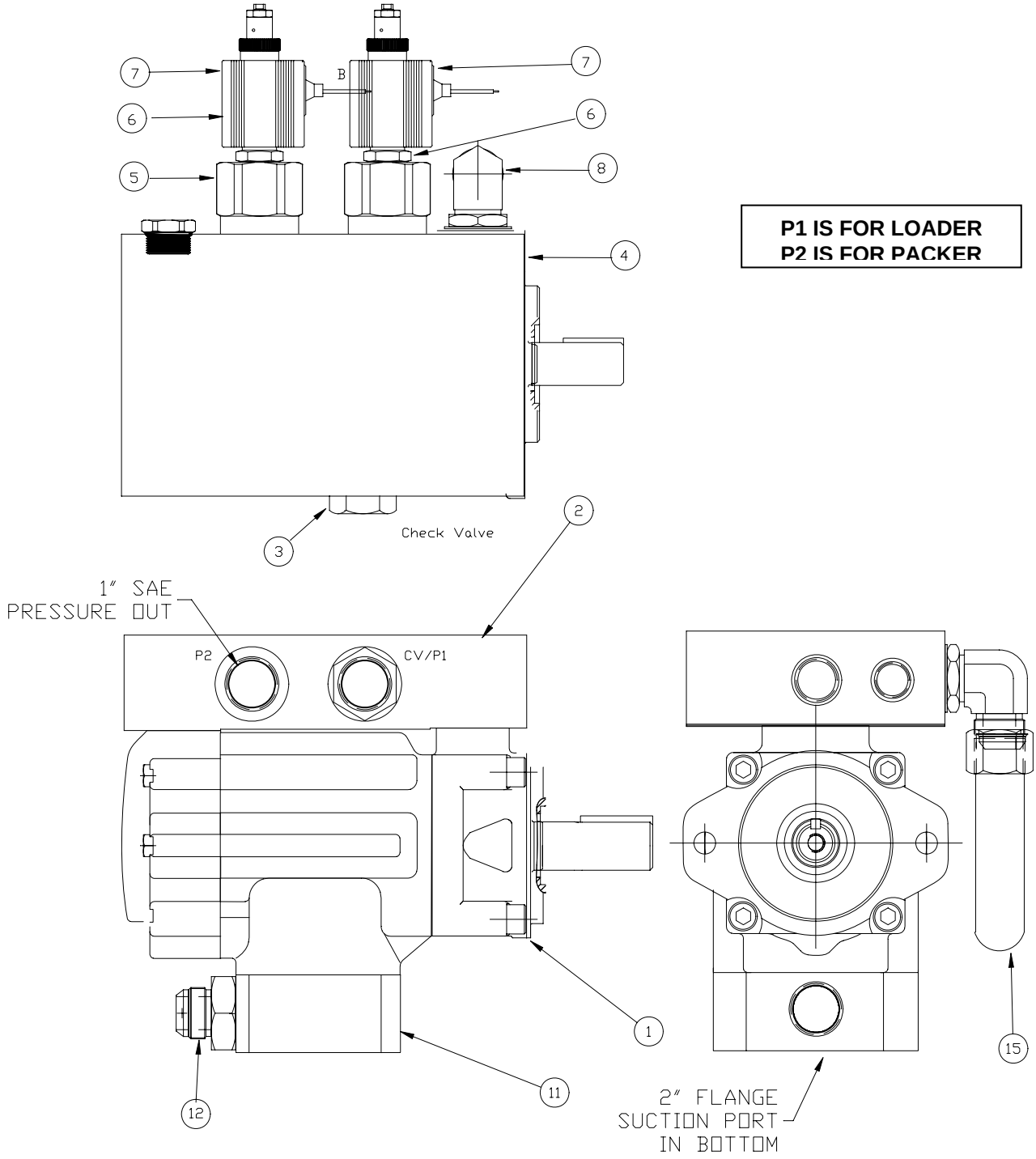
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TANDEM VANE PUMP ONLY (Keyed Shaft)
Front Mount - 219-2269-001 (CCW Rotation)
PTO Mount – 219-2271-001 (CW Rotation)

REF	PART NO.	DESCRIPTION	REQ'D
1	219-2260-010	CAP, end	1
2	219-2260-011	PLATE, PRESSURE PORT	2
3	219-2260-012	ROTOR INSERT ASSEMBLY	1
4	219-2260-013	VANE	24
5	219-2269-014	RING, cam (028)	2
	219-2265-015	RING, cam (050)	2
6	219-2260-016	PLATE, rear port	2
7	219-2260-017	BUSH	1
8	219-2260-018	HOUSING	1
9	219-2260-019	PIN, vane holdout	24
10	219-2260-020	ROTOR INSERT ASSEMBLY	1
11	219-2260-021	CAP, mounting	1
12	219-2260-022	SHAFT	1
13	219-2260-023	KEY	1
14	219-2260-024	SEAL, shaft	1
15	219-2260-025	BEARING, ball	1
16	219-2260-026	RING, round section	1
17	219-2260-027	RING, retaining	1
18	219-2260-028	SCREW	4
19	219-2260-029	WASHER, lock – internal tooth	4
20	219-2260-030	PIN, dowel	2
21	219-2260-031	PIN, dowel	4
22	219-2260-032	SEAL, square section	2
23	219-2260-033	RING, back-up	2
24	219-2260-034	SEAL, square section	2
25	219-2260-035	SEAL, square section	2
26	219-2260-036	SCREW	8
-	219-2260-037	CART. & PLATE ASSEMBLY	1
-	219-2269-038	CART. & PLATE ASSEMBLY (counterclockwise rotation)	1
-	219-2271-038	CART & PLATE ASSEMBLY (clockwise rotation)	1
-	219-2260-039	SEAL KIT	1
-	219-2260-040	SHAFT & BEARING ASSEMBLY	1
-	219-2260-041	REAR PORT PLATE & BUSH ASSEMBLY	1

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TANDEM VANE PUMP ASSEMBLY (Operate-In-Gear)
FRONT MOUNT – 219-2288
PTO MOUNT – 219-2289



P1 IS FOR LOADER
P2 IS FOR PACKER

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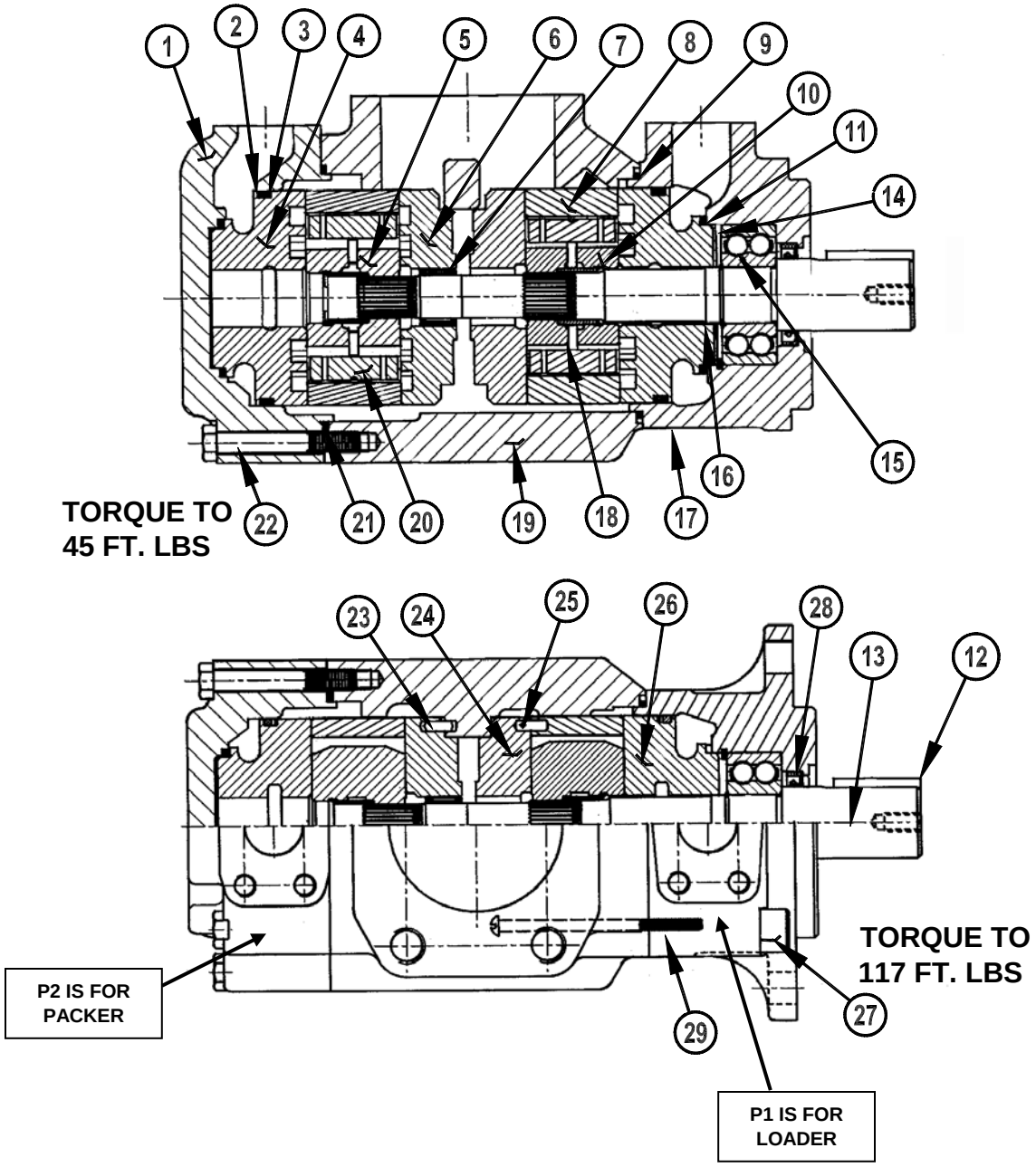
FORMULA 5000

TANDEM VANE PUMP ASSEMBLY (Operate-In-Gear)
FRONT MOUNT – 219-2288
PTO MOUNT – 219-2289

REF	PART NO.	DESCRIPTION	REQ'D
1	219-2281	PUMP, hydraulic – Front Mount (see page 5.75.3)	1
	219-2282	PUMP, hydraulic – PTO mount (see page 5.75.3)	1
2	031-6375	BLOCK, combined flow	1
3	031-6375-001	VALVE, check	1
4	031-6375-002	BLOCK	1
5	031-6375-003	VALVE, logic (2 way)	2
6	031-6375-004	VALVE, solenoid - N.O.	2
7	031-6375-005	COIL – 12v – with leads	2
8	031-6375-006	ELBOW, 90°	1
9	031-6375-007	O-RING (block to pump)	1
10	031-2256-010	CAPSCREW – 3/8" – 16NC x 2-1/2"	8
	031-2256-011	WASHER, lock – 3/8"	8
11	031-6376	BLOCK, inlet	1
12	031-6376-001	ADAPTER	1
13	031-6375-007	O-RING (block to pump)	1
14	031-2256-010	CAPSCREW – 3/8" – 16NC x 2-1/2"	4
	031-2256-011	WASHER, lock – 3/8"	4
15	219-2288-001	TUBE, bypass	1

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TANDEM VANE HYDRAULIC PUMP ONLY (Keyed Shaft)
219-2281 - FRONT MOUNT - (LH rotation)
219-2282 – PTO MOUNT – (RH Rotation)



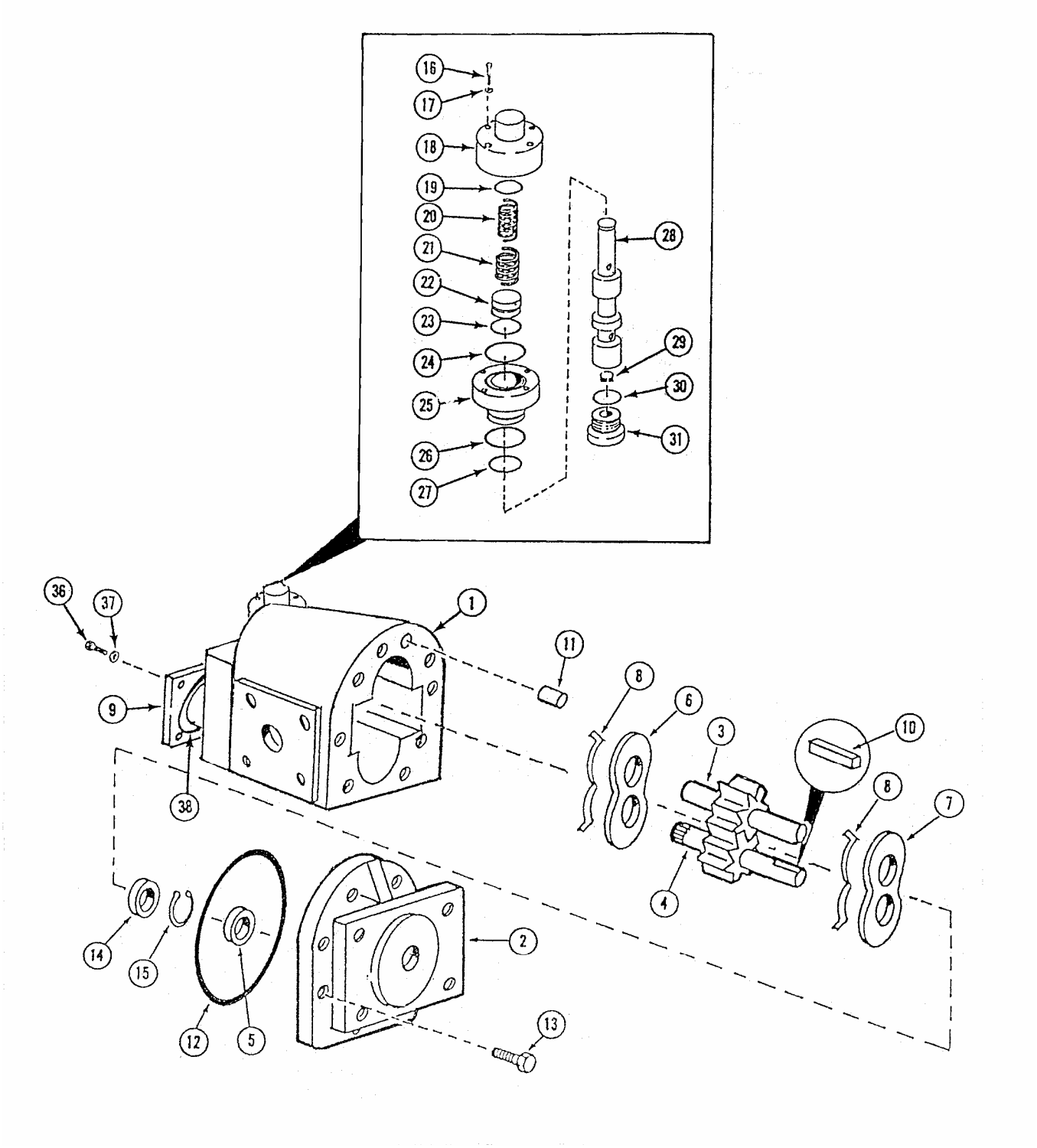
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TANDEM VANE HYDRAULIC PUMP ONLY (Keyed Shaft)
219-2281 - FRONT MOUNT - (LH rotation)
219-2282 – PTO MOUNT – (RH Rotation)

REF	PART NO.	DESCRIPTION	REQ'D
1	219-2076-025	CAP, end	1
2	219-2076-026	SEAL, section square	2
3	219-2076-027	RING, back-up	2
4	219-2076-028	PLATE, pressure port	1
5	219-2076-029	ROTOR INSERT ASSEMBLY	1
6	219-2076-030	PLATE, rear port	1
7	219-2076-031	BEARING, needle	1
8	219-2273-032	RING, cam - for 31 GPM – front P1 pump – RH rotation	1
	219-2272-032	RING, cam - for 31 GPM – front P1 pump – LH rotation	1
	219-2282-070	RING, cam - for 31 GPM - rear P2 pump – RH rotation	1
	219-2281-070	RING, cam - for 31 GPM – rear P2 pump – LH rotation	1
9	219-2076-033	O-RING	1
10	219-2076-034	ROTOR INSERT ASSEMBLY	1
11	219-2076-035	SEAL, section square	2
12	219-2076-036	KEY	1
13	219-2076-037	SHAFT (keyed)	1
14	219-2076-038	RING, retaining	1
15	219-2076-039	BEARING, ball	1
16	219-2076-040	RING, round section	1
17	219-2076-041	CAP, mounting	1
18	219-2076-042	PIN, vane holdout	20
19	219-2076-043	HOUSING	1
20	219-2076-044	VANE	20
21	219-2076-045	SEAL, section square	1
22	219-2076-046	SCREW	7
23	219-2076-047	PIN, dowel	2
24	219-2076-048	PLATE, pressure port	1
25	219-2076-049	PIN, dowel	4
26	219-2076-050	PLATE, rear port	1
27	219-2076-051	SCREW	4
28	219-2076-052	SEAL, shaft	1
29	219-2076-053	SCREW	4
-	219-2076-054	REPAIR KIT (cartridge and plate assembly) (for 219-2281 pump)	1
-	219-2256-100	REPAIR KIT (cartridge and plate assembly) (for 219-2282 pump)	1
-	219-2076-055	SEAL KIT	1
-	219-2076-056	SHAFT & BEARING KIT	1
-	219-2076-057	REAR PORT PLATE & BUSHING	1

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PTO MOUNT HYDRAULIC PUMP with FLOW REGULATOR
219-2245
219-2245-003 – PUMP ONLY



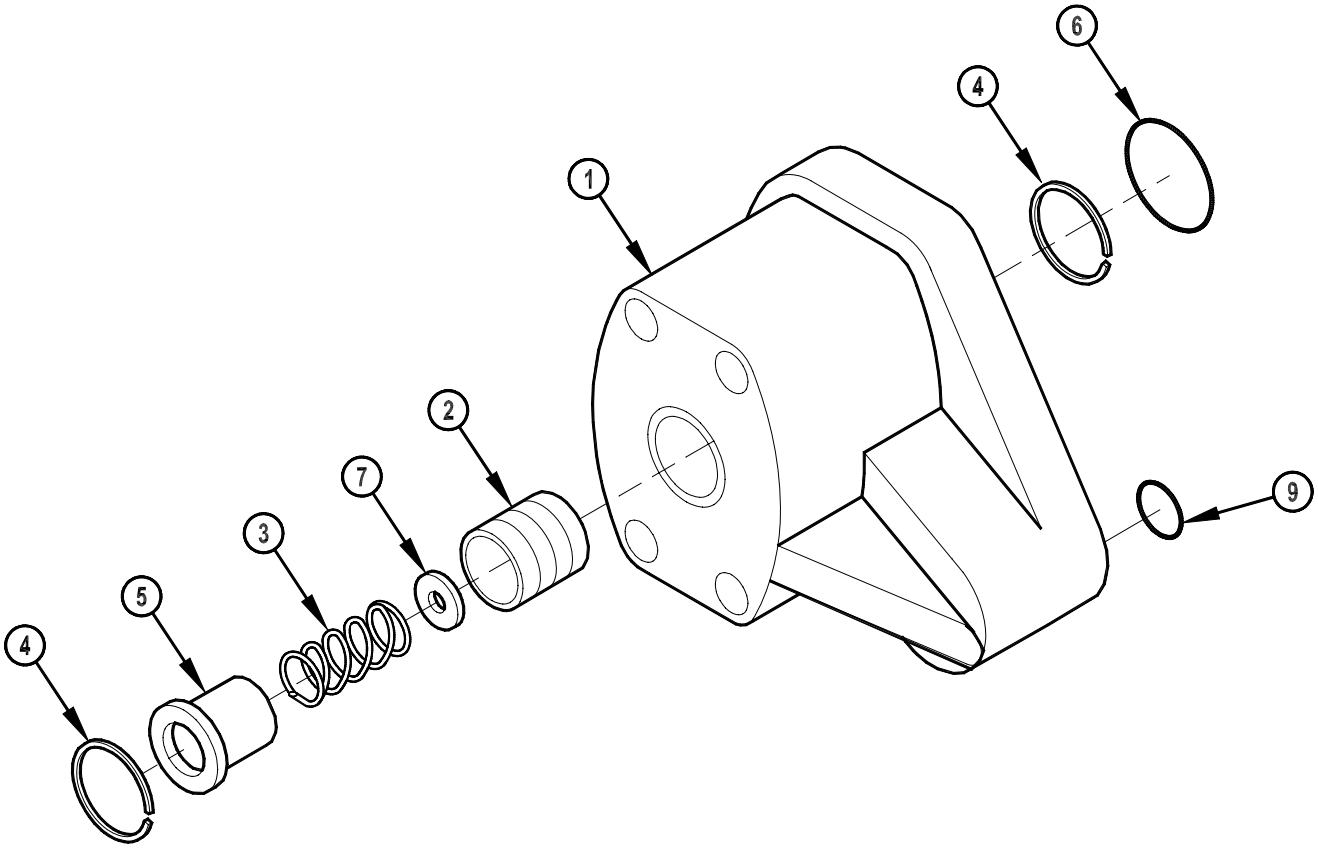
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PTO MOUNT HYDRAULIC PUMP with FLOW REGULATOR
219-2245
219-2245-003 – PUMP ONLY

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1894-001	BODY	1
2	219-1884-014	FLANGE	1
3	219-1894-002	GEAR, idler	1
4	219-1894-004	GEAR, drive	1
5	NSS	SEAL	1
6	219-1995-005	PLATE, pressure – (top)	1
7	219-1995-006	PLATE, pressure – (bottom)	1
8	NSS	RING, back-up	2
9	219-1894-012	PLATE, cover	1
10	219-1665-018	KEY	1
11	219-1665-019	DOWEL	2
12	NSS	SEAL, gasket	1
13	219-1884-020	CAPSCREW – 1/2" – 13NC x 1-1/2"	8
14	NSS	SEAL	1
15	NSS	RING, snap	1
16	219-1884-036	CAPSCREW – 1/4" – 20NC x 2-3/4"	4
17	219-1884-035	WASHER	4
18	219-1884-024	CAP, valve	1
19	NSS	O-RING	1
20	219-1884-028	SPRING	1
21	219-1884-037	SPRING	1
22	219-1884-026	PISTON, air	1
23	NSS	O-RING	1
24	NSS	O-RING	1
25	219-1884-023	BLOCK, valve	1
26	NSS	O-RING	1
27	NSS	O-RING	1
28	219-1884-025	SPOOL, valve	1
29	219-1665-013	PLUG, pipe – 1/8" – 27NPT	1
30	NSS	O-RING	1
31	219-1884-027	PLUG	1
32	219-1884-038	PLUG	1
33	NSS	O-RING	1
34	219-1884-044	PLUG	1
35	219-1884-045	O-RING	1
36	219-1894-013	CAPSCREW	4
37	219-1665-041	WASHER	4
38	NSS	O-RING	1
-	219-1894-16	KIT, shaft seal – (consists of items 5, 12, 14, 5)…….A/R	
-	219-1894-15	KIT, seal repair – (consists of items 5, 8, 12, 14, 15, 19, 23, 24, 26, 27, 30, 33, 38)…….A/R	

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FLOW REGULATOR for 219-2245 PUMP
219-2094-004



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FLOW REGULATOR for 219-2245 PUMP
219-2094-004

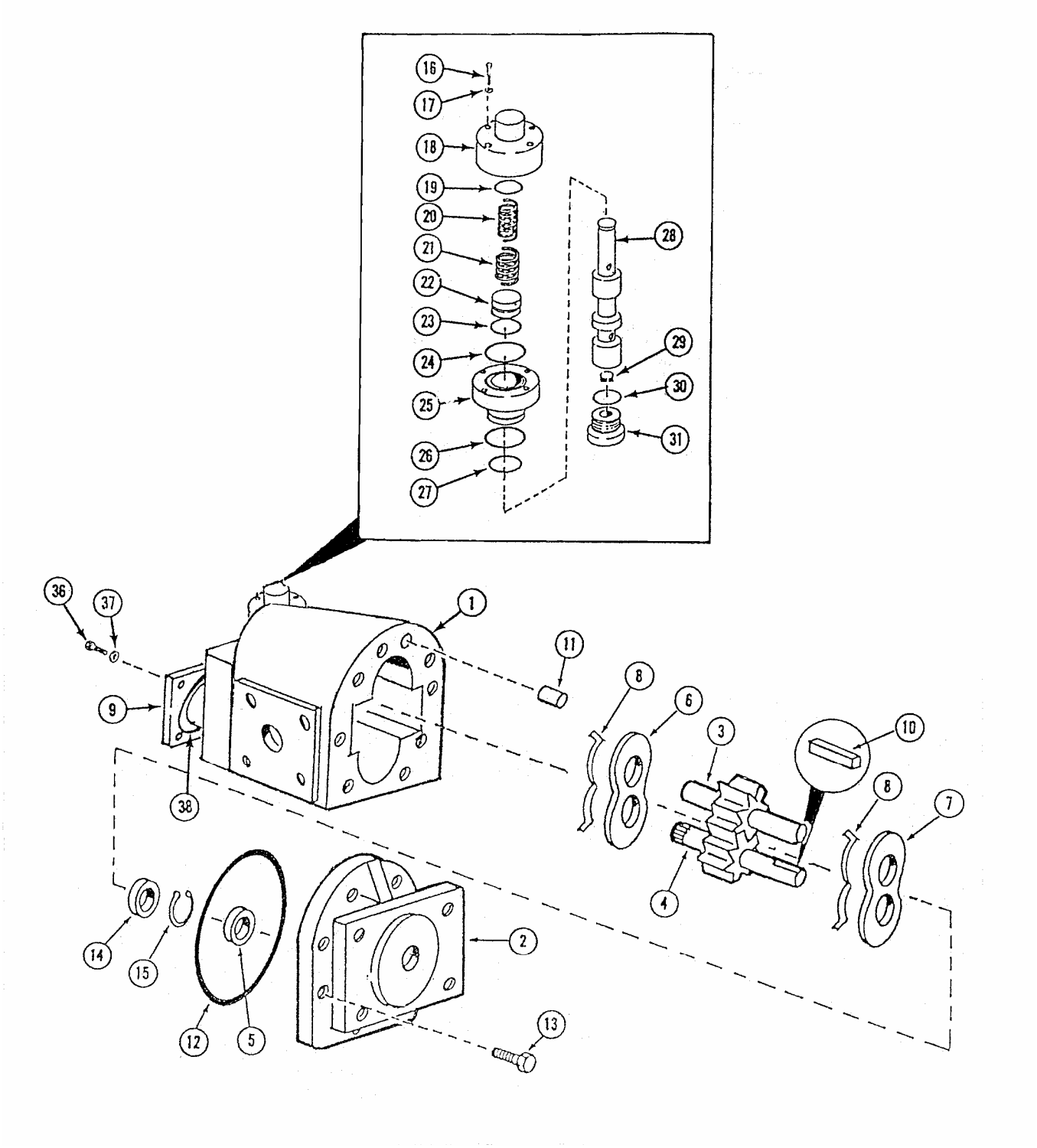
REF	PART NO.	DESCRIPTION	REQ'D
1	219-1995-017	HOUSING	1
2	219-1995-018	SPOOL	1
3	219-1995-019	SPRING	1
4	219-1995-026	RING, snap	2
5	219-1995-020	POT, dasher	1
6	219-2094-050	O-RING	1
7	219-2245-002	WASHER – orifice - .500"	1
8	219-1995-023	CAPSCREW – 7/16" – 14NC x 3-3/4"	4
9	219-1995-024	O-RING	1
10	219-1995-025	CAPSCREW – 7/16" – 14NC x 3"	2

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FRONT MOUNT HYDRAULIC PUMP
219-2224



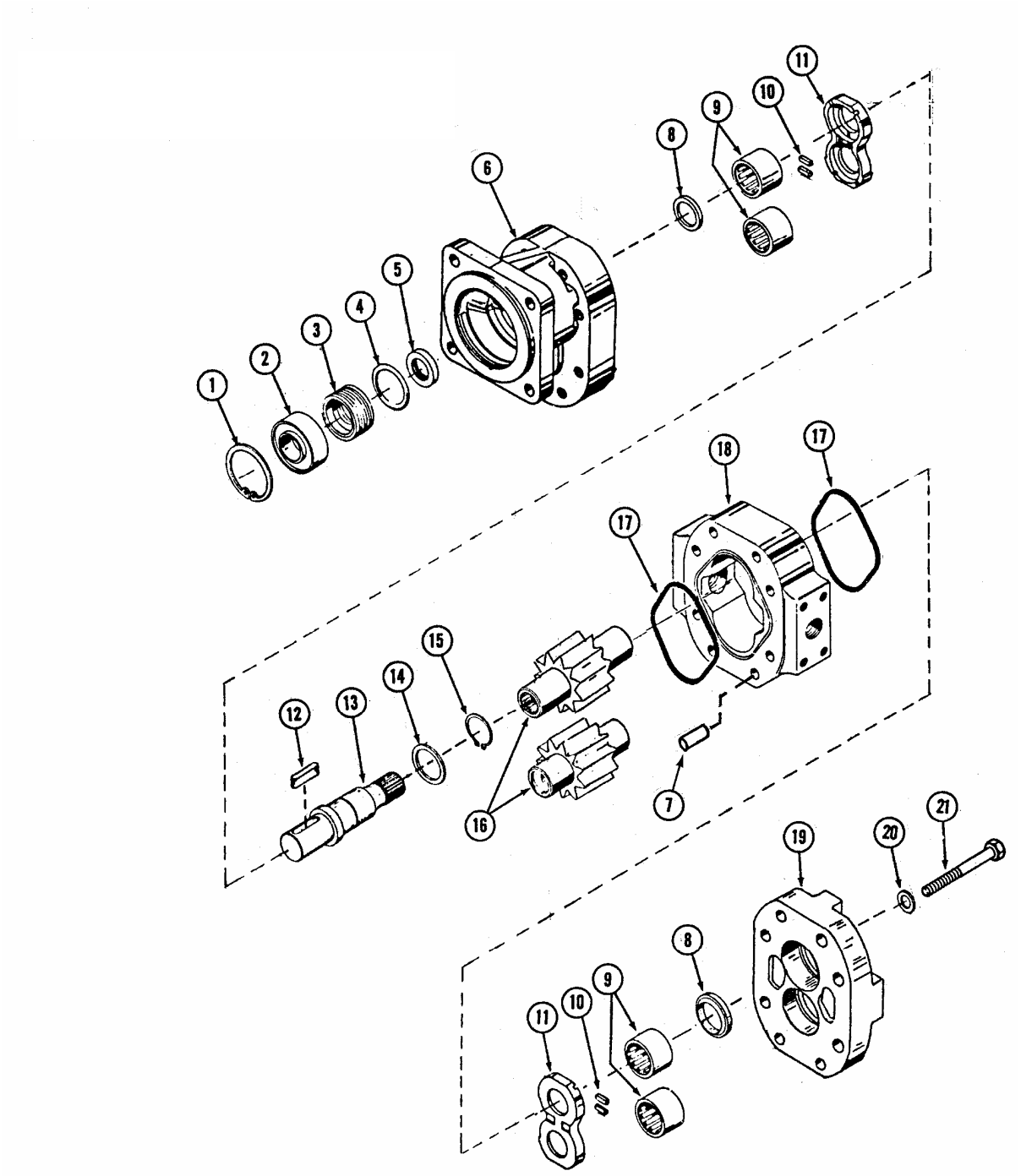
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FRONT MOUNT HYDRAULIC PUMP
219-2224

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1894-001	BODY	1
2	219-1884-014	FLANGE	1
3	219-1894-002	GEAR, idler	1
4	219-1894-004	GEAR, drive	1
5	NSS	SEAL	1
6	219-1995-005	PLATE, pressure – (top)	1
7	219-1995-006	PLATE, pressure – (bottom)	1
8	NSS	RING, back-up	2
9	219-1894-012	PLATE, cover	1
10	219-1665-018	KEY	1
11	219-1665-019	DOWEL	2
12	NSS	SEAL, gasket	1
13	219-1884-020	CAPSCREW – 1/2" – 13NC x 1-1/2"	8
14	NSS	SEAL	1
15	NSS	RING, snap	1
16	219-1884-036	CAPSCREW – 1/4" – 20NC x 2-3/4"	4
17	219-1884-035	WASHER	4
18	219-1884-024	CAP, valve	1
19	NSS	O-RING	1
20	219-1884-028	SPRING	1
21	219-1884-037	SPRING	1
22	219-1884-026	PISTON, air	1
23	NSS	O-RING	1
24	NSS	O-RING	1
25	219-1884-023	BLOCK, valve	1
26	NSS	O-RING	1
27	NSS	O-RING	1
28	219-1884-025	SPOOL, valve	1
29	219-1665-013	PLUG, pipe – 1/8" – 27NPT	1
30	NSS	O-RING	1
31	219-1884-027	PLUG	1
32	219-1884-038	PLUG	1
33	NSS	O-RING	1
34	219-1884-044	PLUG	1
35	219-1884-045	O-RING	1
36	219-1894-013	CAPSCREW	4
37	219-1665-041	WASHER	4
38	NSS	O-RING	1
-	219-1894-016	KIT, shaft seal – (consists of items 5, 12, 14, 15)……A/R	
-	219-1894-015	KIT, seal repair – (consists of items 5, 8, 12, 14, 15, 19, 23,	

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HYDRAULIC PUMP
219-2231 – FRONT MOUNT - (CCW ROTATION)
219-2232 – PTO MOUNT - (CW ROTATION)



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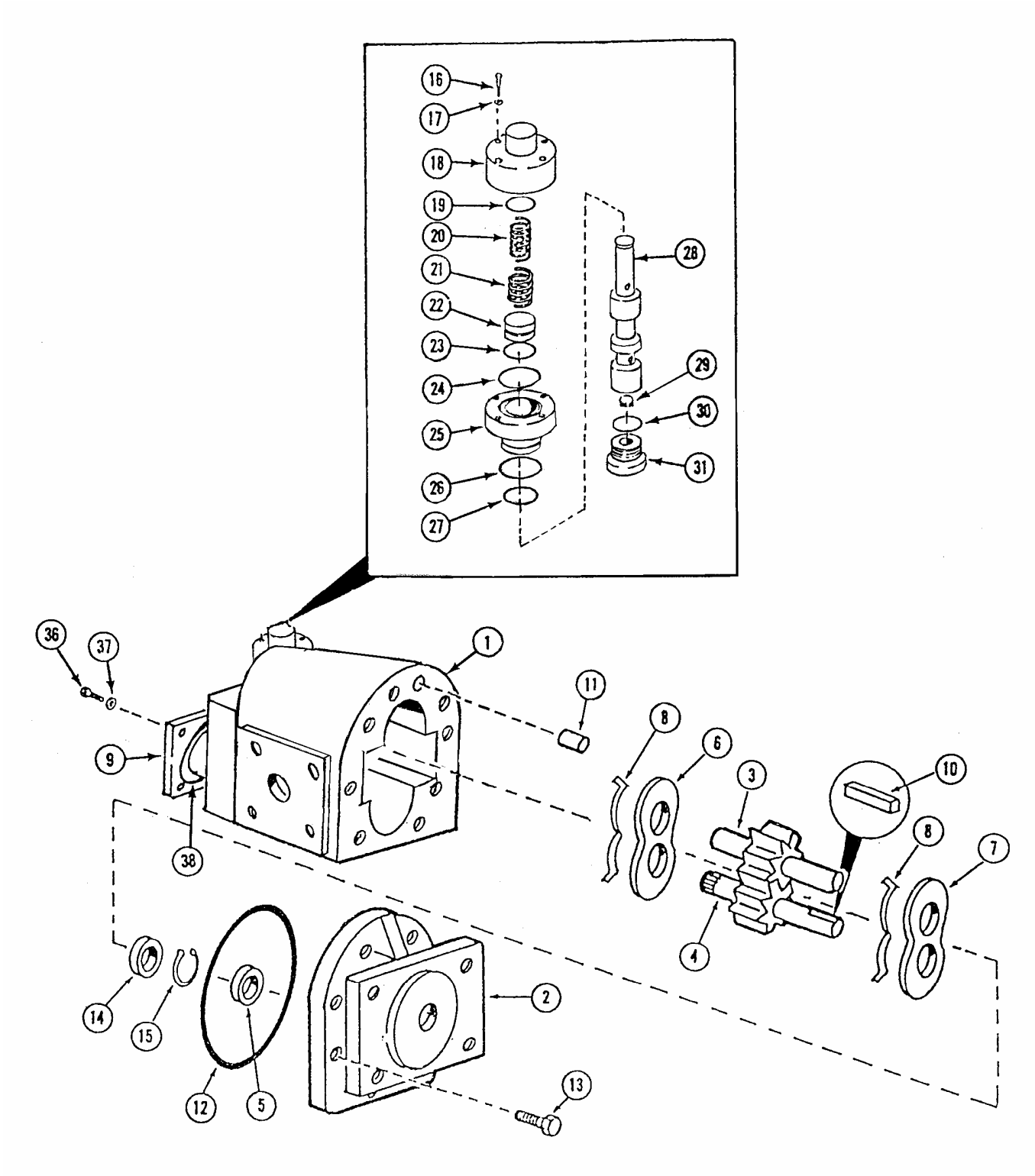
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HYDRAULIC PUMP
219-2231 – FRONT MOUNT - (CCW ROTATION)
219-2232 – PTO MOUNT - (CW ROTATION)

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1473-002	RING, snap	1
2	219-1473-008	RING, bearing retainer	1
3	219-1684-007	RETAINER, seal	1
4	219-1473-005	O-RING	1
5	219-1684-008	SEAL	1
6	219-1870-002	COVER, shaft end	1
7	219-1684-011	PIN, dowel	4
8	219-1870-005	SEAL, ring	2
9	219-1473-007	BEARING, roller	4
10	219-1870-007	SEAL, pocket	12
11	219-1870-006	PLATE, thrust	2
12	219-1473-014	KEY	1
13	219-1473-017	SHAFT	1
14	219-1473-015	SPACER	1
15	219-1473-016	RING, retaining	1
16	219-1473-018	GEARS (matched set)	1
17	219-1473-011	SEAL, gasket	2
18	219-1473-019	HOUSING, gear	1
19	219-1870-008	COVER, port end	1
20	219-1473-021	WASHER	8
21	219-1473-020	CAPSCREW	8
22	219-1473-009	CHECK	2
23	219-1683-005	NUT	4

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FRONT MOUNT HYDRAULIC PUMP
219-1894



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FRONT MOUNT HYDRAULIC PUMP
219-1894

REF	PART NO.	DESCRIPTION	REQ'D
1	219-1894-001	BODY	1
2	219-1884-014	FLANGE	1
3	219-1894-002	GEAR, idler	1
4	219-1894-004	GEAR, drive	1
5	NSS	SEAL	1
6	219-1884-016	PLATE, pressure – (top)	1
7	219-1884-017	PLATE, pressure – (bottom)	1
8	NSS	RING, back-up	2
9	219-1894-012	PLATE, cover	1
10	219-1665-018	KEY	1
11	219-1665-019	DOWEL	2
12	NSS	O-RING	1
13	219-1884-020	CAPSCREW – 1/2" – 13NC x 1-1/2"	8
14	NSS	SEAL	1
15	NSS	RING, snap	1
16	219-1884-036	CAPSCREW – 1/4" – 20NC x 2-3/4"	4
17	219-1884-035	WASHER	4
18	219-1884-024	CAP, valve	1
19	NSS	O-RING	1
20	219-1884-028	SPRING	1
21	219-1884-037	SPRING	1
22	219-1884-026	PISTON, air	1
23	NSS	O-RING	1
24	NSS	O-RING	1
25	219-1884-023	BLOCK, valve	1
26	NSS	O-RING	1
27	NSS	O-RING	1
28	219-1884-025	SPOOL, valve	1
29	219-1884-040	PLUG, pipe – 1/8"	1
30	219-1894-008	O-RING	1
31	219-1884-027	PLUG	1
32	219-1884-038	PLUG	1
33	NSS	O-RING	1
34	219-1884-044	PLUG	1
35	219-1884-045	O-RING	1
36	219-1894-013	CAPSCREW	4
37	219-1665-041	WASHER	4
38	NSS	O-RING	1
-	219-1894-016	KIT, shaft seal – (consists of items 5, 12, 14, 15)	A/R
-	219-1894-015	KIT, seal repair – (consists of items 5, 8, 12, 14, 15, 19, 23, 24, 26, 27, 30, 33, 38)	A/R

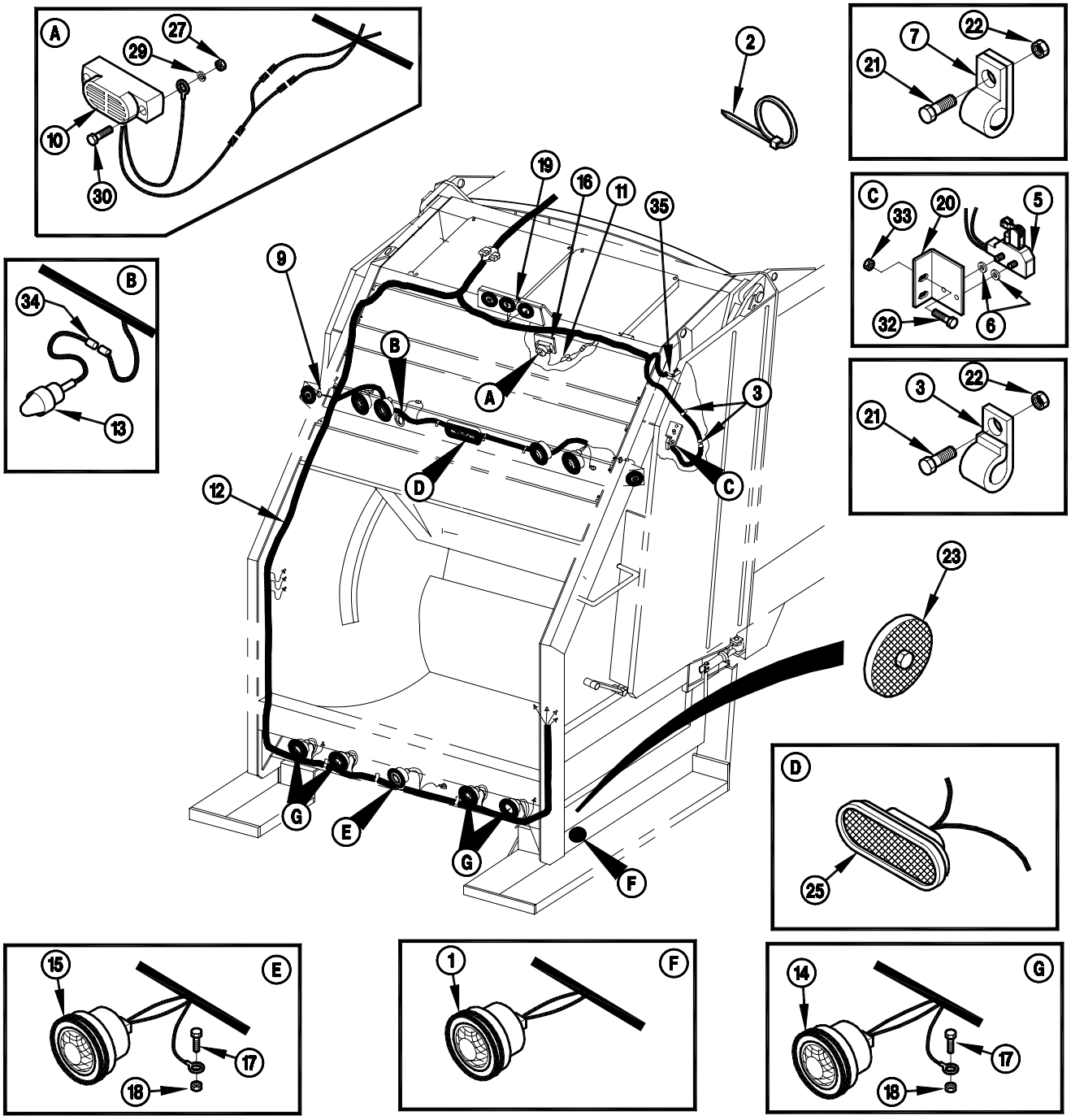
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SECTION 6 – ELECTRICAL and ATTACHING PARTS

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Body Wiring and Parts - LED 6.9
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TAILGATE WIRING



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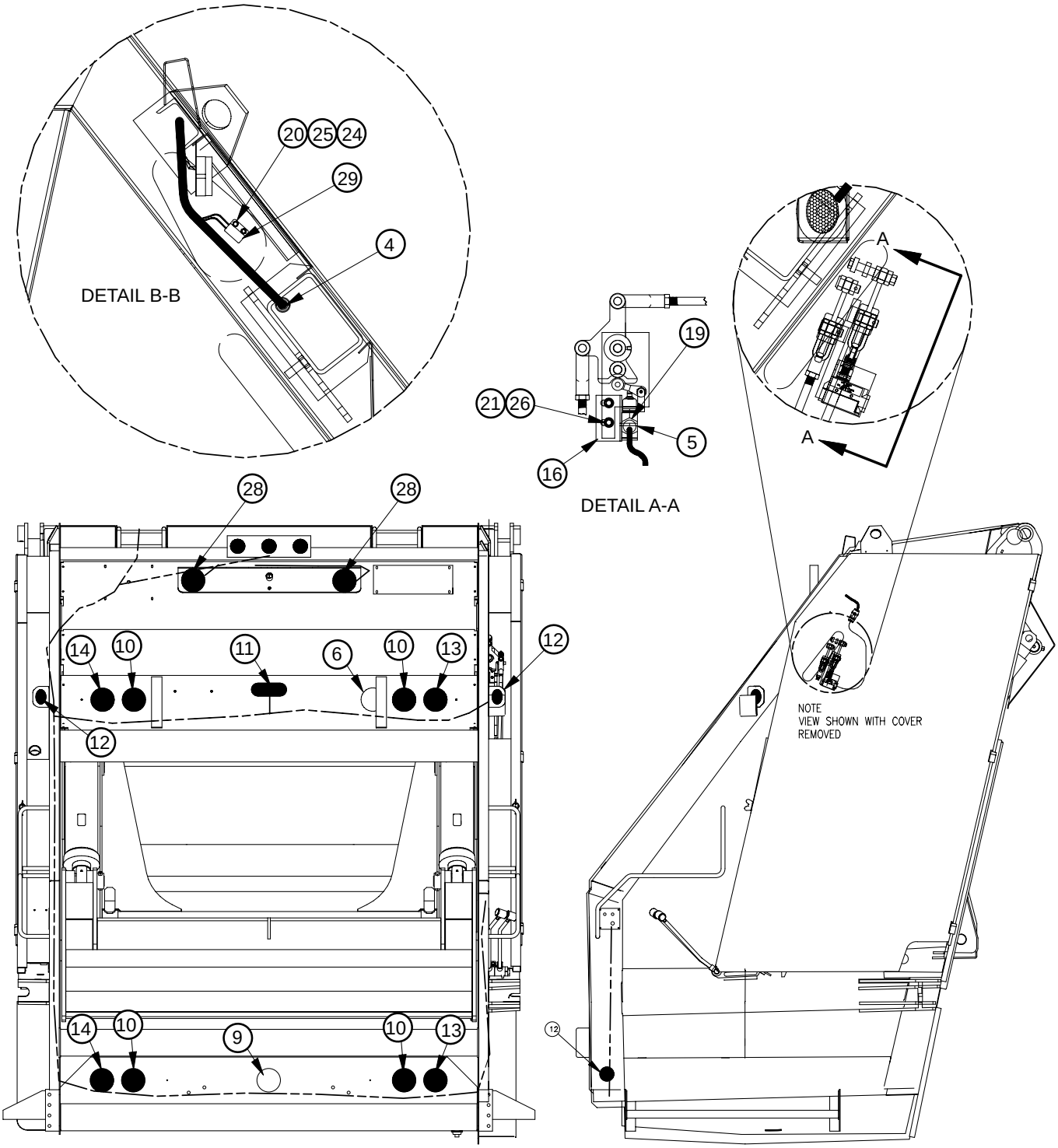
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TAILGATE WIRING

REF	PART NO.	DESCRIPTION	REQ'D
1	115-0760	LIGHT, clearance - red	7
	115-0760-001	LIGHT	1
	115-0760-002	MOUNT, rubber	1
	115-0760-003	PIGTAIL	1
2	036-1115	TIE, plastic	3
3	036-1249	CLIP	7
4	FS420411	SCREW, machine - #10 – 24 x 1/2"	2
5	108-4870	SWITCH, limit	1
6	FS510200	WASHER, flat - #6	2
7	036-1122-014	CLAMP	4
8	FS280400	NUT, hex - #10 – 24NC	2
9	108-0472	GROMMET	2
10	108-3858	ALARM, back-up	1
11	263-0354	HARNESS, blocking diode wire	1
12	263-1062	HARNESS, tailgate wire	1
13	115-0608	LIGHT, license (includes item 34)	1
14	115-0742	LIGHT, stop and directional – red – (includes seal)	8
15	115-0743	LIGHT, back-up – clear – (includes seal)	1
16	211-2852	BRACKET	1
17	FS100711	CAPSCREW – 1/4" – 28NC x 1/2"	3
18	FS240700	NUT, lock – 1/4" – 28NC	3
19	FS420413	SCREW - #10 – 32 x 5/8"	3
20	211-5522	BRACKET, switch	1
21	FS070920	CAPSCRERW – 3/8" – 16NC	4
22	FS230900	NUT, lock – 3/8" – 16NC	4
23	115-0905	REFLECTOR – red	2
24	FS550400	WASHER, lock - #10	2
25	115-0869	LIGHT, stop – red	1
26	108-4484	WIRE, ground – (4" length)	1
27	FS270700	NUT, hex – 1/4" – 28NF	2
28	FS420715	SCREW, machine – 1/4" – 28NF x 3/4"	2
29	FS550700	WASHER, lock – 1/4"	2
30	FS240400	NUT, lock - #10 – 32	3
31	FS520400	WASHER, flat - #10	3
32	FS070820	CAPSCREW – 5/16" – 18NC x 1"	2
33	FS230800	NUT, lock – 5/16" – 18NC	2
34	115-0608-001	LIGHT	1
	115-4827-001	CONNECTOR, 1 way male	1
	115-4827-011	TERMINAL, male	1
	115-4827-013	SEAL, cable	1
35	108-2864	SWITCH, mercury	1
36	115-1226	LIGHT, flood (Not Shown)	2
	115-1225	LIGHT	1

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TAILGATE LIGHTS – SMART LIGHTS



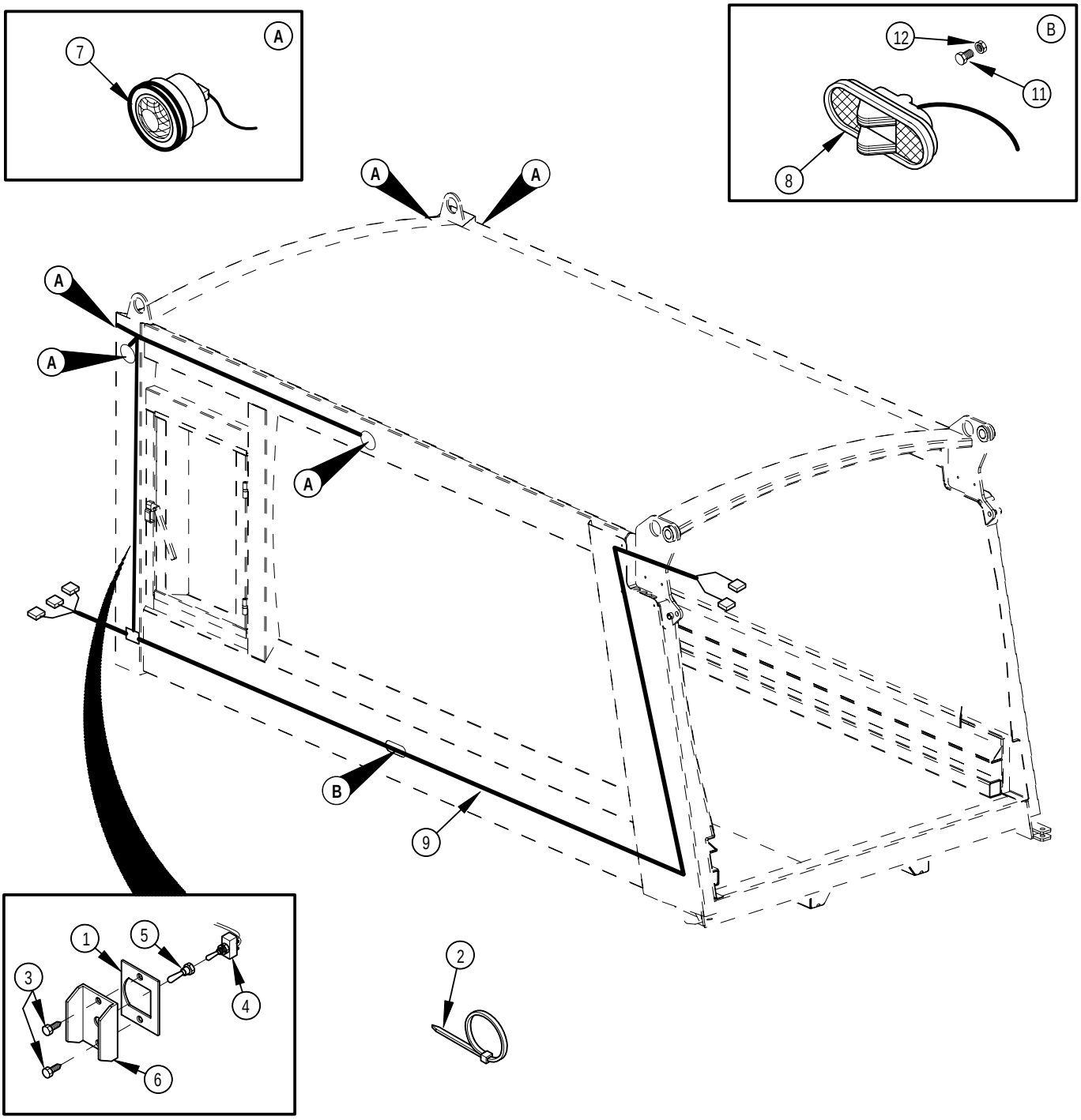
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TAILGATE LIGHTS – SMART LIGHTS

REF	PART NO.	DESCRIPTION	REQ'D
1	036-1115	TIE, plastic	8
2	036-1295-002	CLAMP	20
3	047-2151-001	SCREW, tek	1
4	108-1493	GROMMET	2
5	108-4870	SWITCH, limit	1
6	108-7726	ALARM, back-up	1
	108-7726-001	ALARM – 4"	1
	108-0742-002	GROMMET	1
7	115-0608	LIGHT, license	1
	115-0608-001	LIGHT	1
8	115-0905	REFLECTOR – red	2
9	115-1219	LIGHT, back-up	1
	115-1219-001	LIGHT	1
	115-0742-002	GROMMET	1
10	115-1227	LIGHT, stop, turn, tail	4
	115-1227-001	LIGHT – red	1
	115-0742-002	GROMMET	1
11	115-1229	LIGHT, center brake	1
	115-1229-001	LIGHT – red	1
	115-0869-002	GROMMET	1
12	115-1230	LIGHT, clearance	7
	115-1045-001	LIGHT – red	1
	115-0760-002	GROMMET	1
13	115-1269-001	LIGHT – AMBER – R.H. smart	1
	115-0742-002	GROMMET	1
14	115-1269-002	LIGHT – AMBER – L.H. smart	1
	115-0742-002	GROMMET	1
15	177-4863	CROSSMEMBER, lower light	1
16	211-5522	BRACKET, limit switch	1
17	263-1229	HARNESS, tailgate wire	1
18	FS100711	CAPSCREW – 1/4" – 28NF x 1/2"	2
19	FS510200	WASHER, flat - #6	2
20	FS420412	SCREW, machine - #10 -32 x 1/2"	2
21	FS230800	NUT, lock – 5/16" – 18NC	2
22	FS230900	NUT, lock – 3/8" – 16	20
23	FS240700	NUT, lock – 1/4" – 20NF	2
24	FS550400	WASHER, lock - #10	2
25	FS270400	NUT, lock - #10 – 32	2
26	FS070820	CAPSCREW – 5/16" – 18NC x 1"	2
27	FS070920	CAPSCREW – 3/8" – 16NC	20
28	115-1226	LIGHT, flood	2
	115-1225	LIGHT	1
	108-6461-012	RECEPTICLE, 2-pin	1
	108-7336-002	LOOM	1 ft.
29	108-2864	SWITCH, mercury	1

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BODY WIRING – STANDARD LIGHTING
372-1773



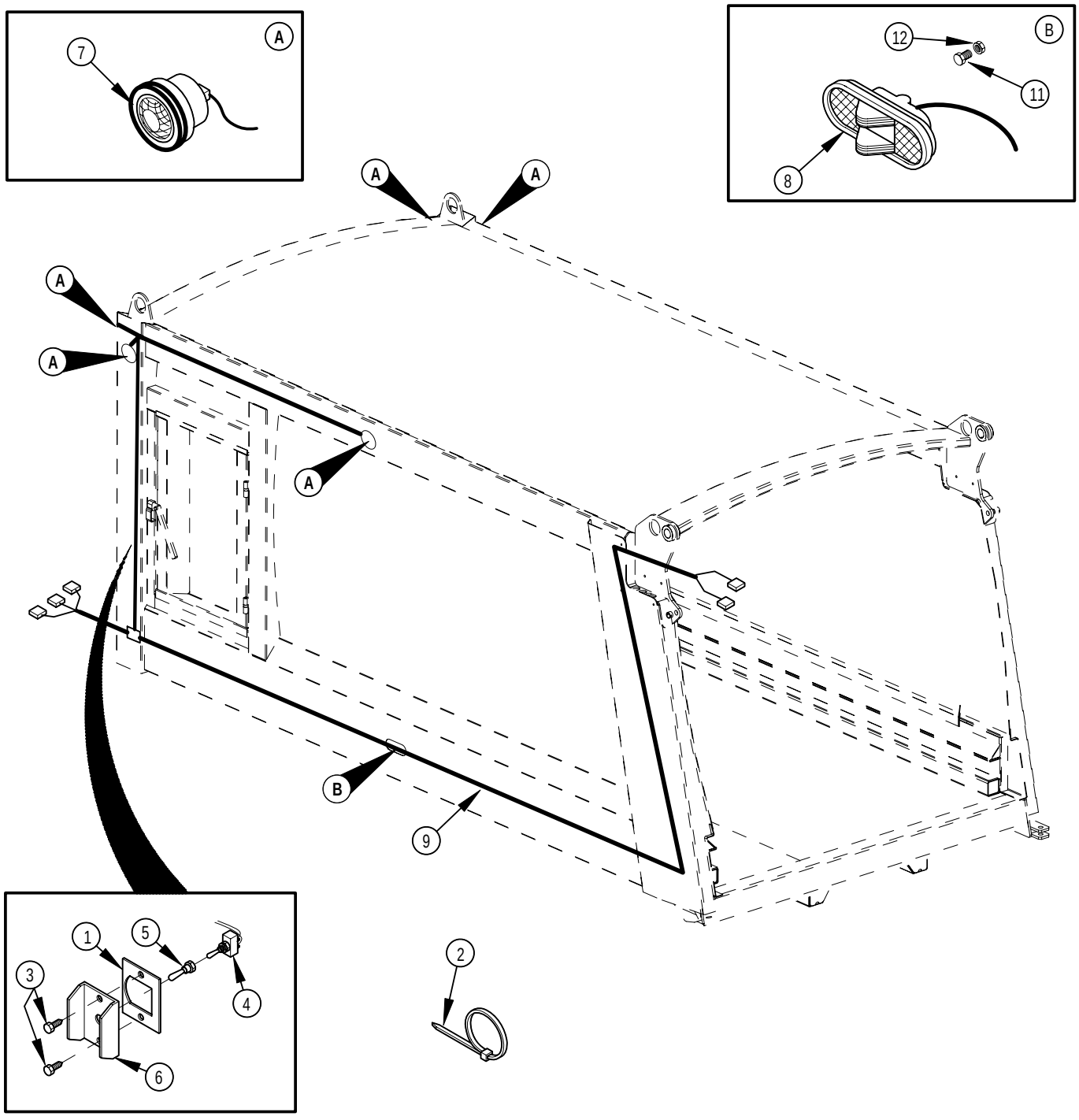
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BODY WIRING – STANDARD LIGHTING
372-1773

REF	PART NO.	DESCRIPTION	REQ'D
1	022-3108	GASKET, throttle bracket	1
2	036-1290	TIE, plastic	20
3	047-2151-001	SCREW, tek	2
4	108-2279	SWITCH, toggle (momentary) N.O.	1
5	108-2280	BOOT	1
6	112-6163	COVER, throttle switch	1
7	115-0761	LIGHT, clearance (amber)	A/R
	115-0761-001	LIGHT	1
	115-0760-002	MOUNT, rubber	1
	115-0760-003	PIGTAIL	1
8	115-0782	LIGHT, mid-body turn indicator	2
	115-0782-001	INDICATOR	1
	115-0782-002	PLUG	1
	115-0782-003	GROMMET	1
9	263-1061-018	HARNESS, body wire – for 18 yd units	1
	263-1061-020	HARNESS, body wire – for 20 yd units	
	263-1061-025	HARNESS, body wire – for 25 yd units	1
	263-1061-027	HARNESS, body wire – for 27 yd units	1
	263-1061-032	HARNESS, body wire – for 32 yd units	1
	263-1061-035	HARNESS, body wire – for 35 yd units	1
	263-1061-040	HARNESS, body wire – for 40 yd units	1
11	FS100711	CAPSCREW – 1/4" – 28NC x 1/2"	1
12	FS240700	NUT, lock – 1/4" – 28NC	1

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BODY WIRING – LED or SMART LIGHT
372-2859



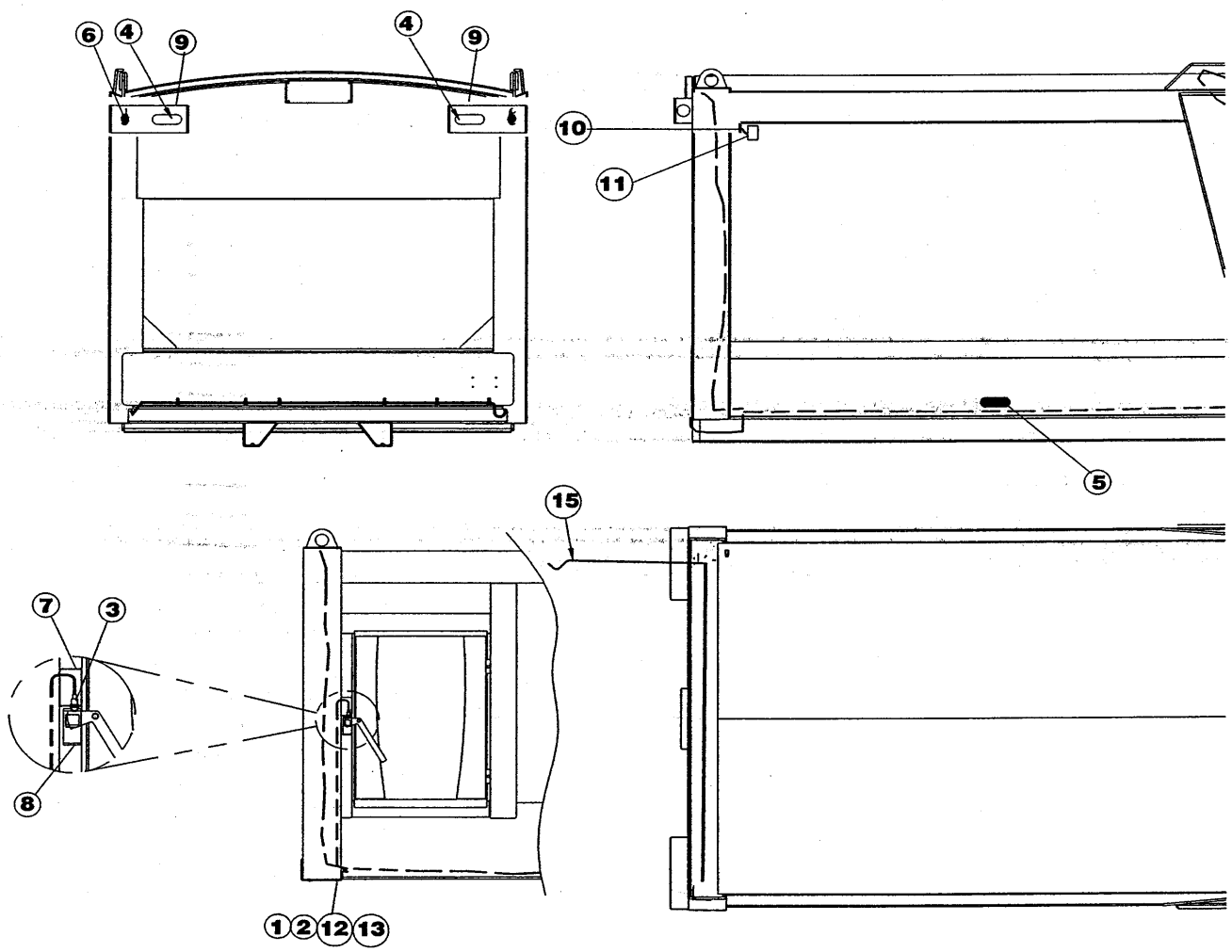
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BODY WIRING – LED or SMART LIGHT
372-2859

REF	PART NO.	DESCRIPTION	REQ'D
1	022-3108	GASKET, throttle bracket	1
2	036-1290	TIE, plastic	20
3	047-2151-001	SCREW, tek	2
4	108-2279	SWITCH, toggle (momentary) N.O.	1
5	108-2280	BOOT	1
6	112-6163	COVER, throttle switch	1
7	115-1231	LIGHT, clearance (amber)	A/R
	115-1046-001	LIGHT	1
	115-0742-002	GROMMET	1
8	115-1228	LIGHT, mid-body turn indicator	2
	115-1228-001	LIGHT, oval	1
	115-0742-002	GROMMET	1
9	263-1228-018	HARNESS, body wire – for 18 yd units	1
	263-1228-020	HARNESS, body wire – for 20 yd units	1
	263-1228-025	HARNESS, body wire – for 25 yd units	1
	263-1228-027	HARNESS, body wire – for 27 yd units	1
	263-1228-032	HARNESS, body wire – for 32 yd units	1
	263-1228-035	HARNESS, body wire – for 35 yd units	1
	263-1228-040	HARNESS, body wire – for 40 yd units	1
11	FS100711	CAPSCREW – 1/4" – 28NC x 1/2"	1
12	FS240700	NUT, lock – 1/4" – 28NC	1

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BODY WIRING – LED
372-1833



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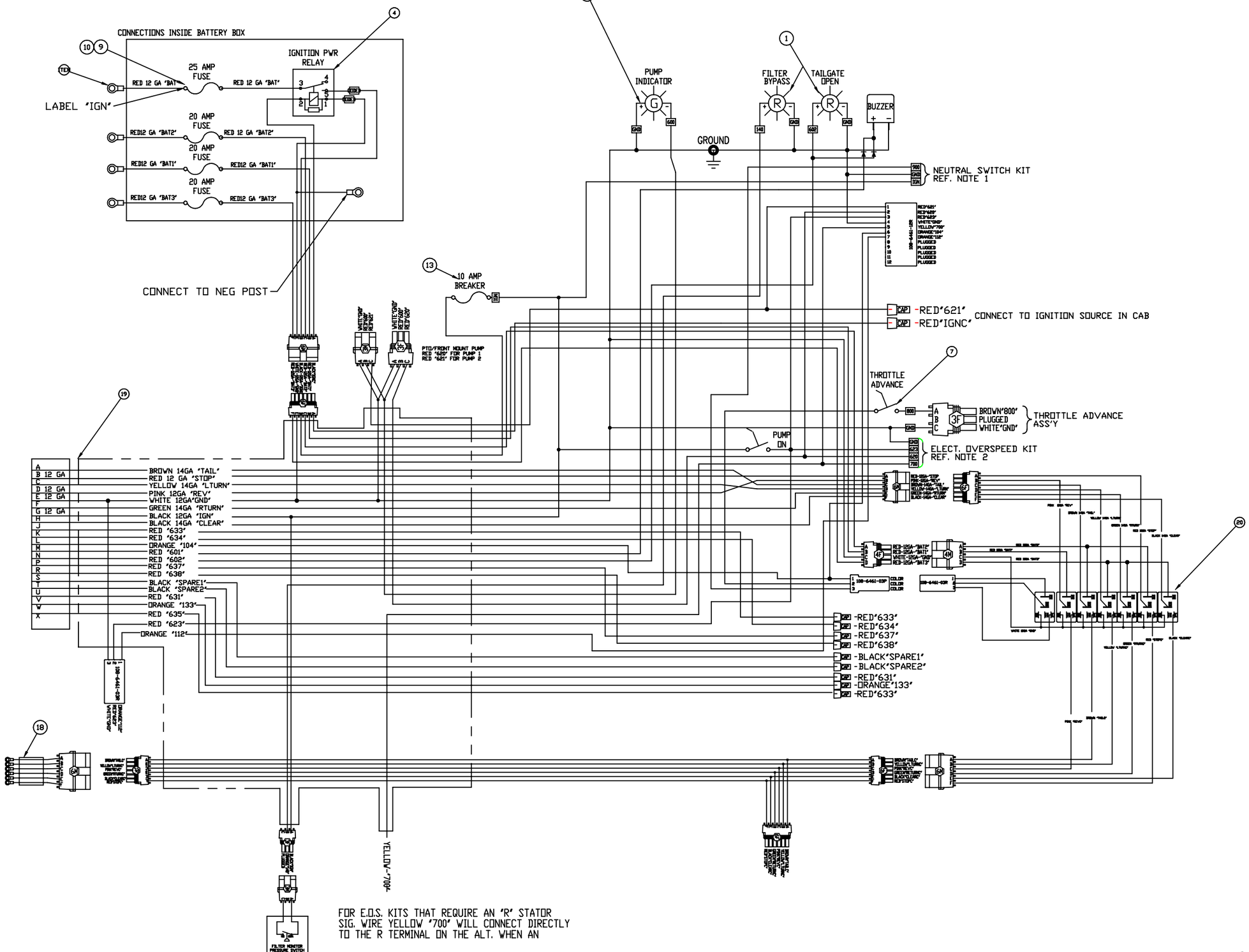
BODY WIRING – LED
372-1833

REF	PART NO.	DESCRIPTION	REQ'D
1	036-1122-006	CLAMP, rubber coated	16
2	047-2151-011	SCREW, tek	4
3	063-0108	SWITCH, proximity – 18MM sourcing	1
4	115-1180	LIGHT, strobe – oval - LED	2
	115-1180-001	LAMP	1
	115-1179-002	PLUG	1
	115-0869-002	GROMMET	1
5	115-1228	LIGHT, mid-body turn indicator	2
	115-1228-001	LIGHT, oval	1
	115-0742-002	GROMMET	1
6	115-1231	LIGHT, clearance (amber)	4
7	311-1636	BRACKET, side door latch	1
8	311-1637	BRACKET, side door prox.	
9	311-2161	BRACKET, light	2
10	311-2163	BRACKET, light	2
11	372-0821	LIGHT,side	2
	115-1223	LIGHT	1
12	FS070920	CAPSCREW – 3/8" – 16NC x 1"	16
13	FS230900	NUT, lock – 3/8" – 16NC	16
14	263-1140-018	HARNESS, body wire – for 18 yd units	1
	263-1140-020	HARNESS, body wire – for 20 yd units	1
	263-1140-025	HARNESS, body wire – for 25 yd units	1
	263-1140-027	HARNESS, body wire – for 27 yd units	1
	263-1140-032	HARNESS, body wire – for 32 yd units	1

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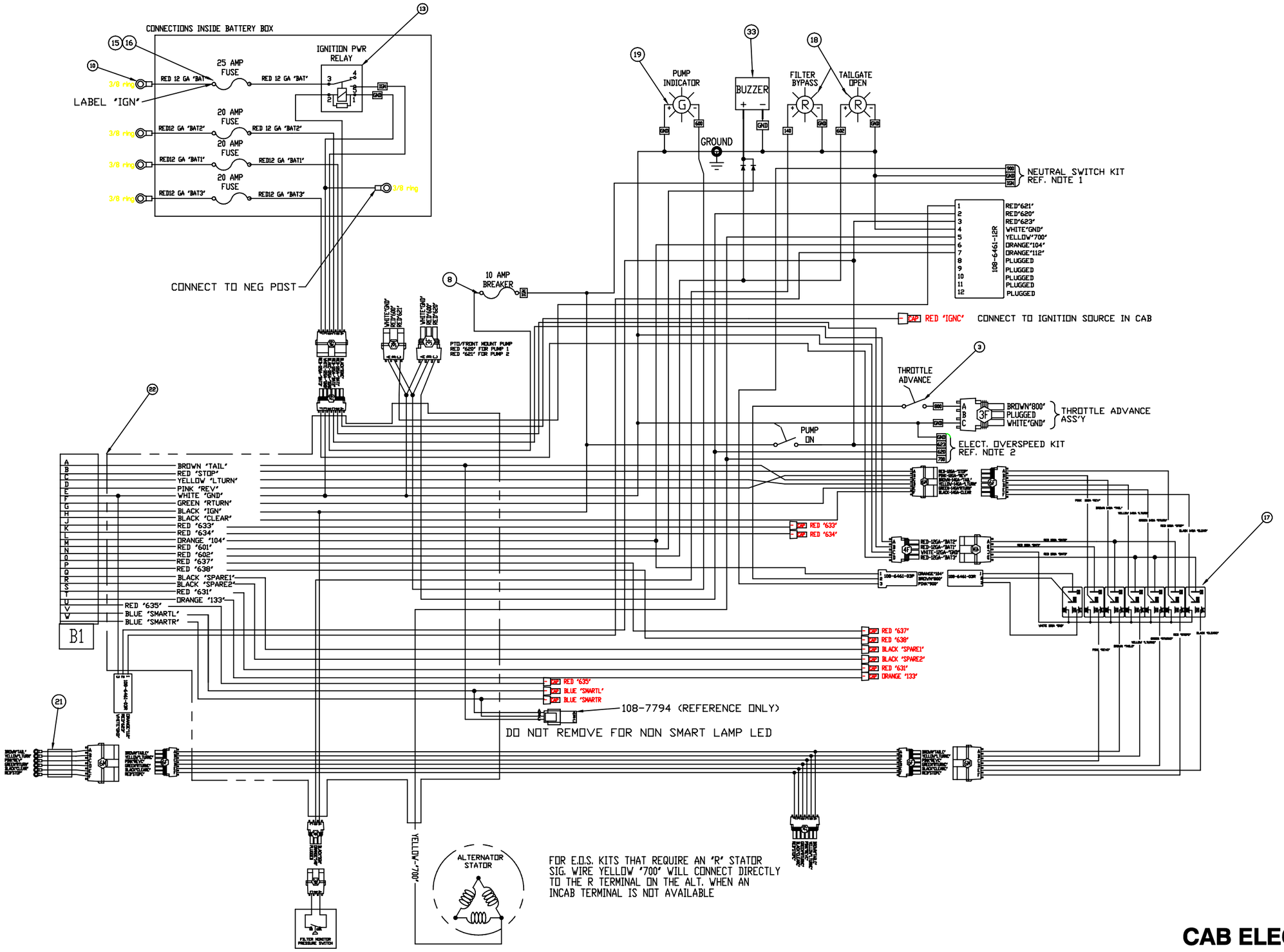


CAB ELECTRICAL KIT
DP5000 - STANDARD
372-1772

CAB ELECTRICAL KIT - STANDARD
372-1772

REF	PART NO.	DESCRIPTION	REQ'D
1	115-0766	LIGHT, indicator – red	2
	115-0766-002	BULB	1
	115-0766-003	LENS	1
2	115-0886	LIGHT, indicator – green	1
	115-0766-002	BULB	1
	115-0886-003	LENS	1
3	108-4827-112	TERMINAL, male	12
4	108-6752	RELAY	1
5	108-0147	BUZZER	1
6	108-0880	SPADE	2
7	108-1814	SWITCH, toggle	2
8	108-2050	SPADE – 3/16"	6
9	108-7790	HOLDER, fuse	4
10	108-7112-025	FUSE – 25 AMP	1
11	108-3647	CONNECTOR, closed end	2
12	108-4476	LOOM	12 ft
13	108-4867-005	BREAKER, circuit – 10 A	1
15	108-4943-003	RING, terminal - #10	6
16	108-5717-002	CONNECTOR, butt	8
17	212-2410	DECAL, control	1
18	263-0075	HARNESS, light wire	1
19	263-1044	HARNESS, cab to body wire	1
20	108-7811-001	STRIP, relay	1
21	108-7112-020	FUSE, 20 AMP	3
22	108-4943-006	TERMINAL, ring – 3/8"	5
23	108-6461-010	RECEPTICLE, 12-way	1
24	108-4827-121	TERMINAL, female	3
25	108-4827-122	TERMINAL, female	10
26	108-4827-006	CONNECTOR, 3-way female	1
27	108-4827-009	CONNECTOR, 6-way female	2
28	108-4827-008	CONNECTOR, 4-way female	1
29	108-4827-130	SEAL, cable	19
30	108-4827-134	PLUG, cavity	1
31	108-7114-010	DISCONNECT, female quick	6
32	108-5717-003	CONNECTOR, butt	6

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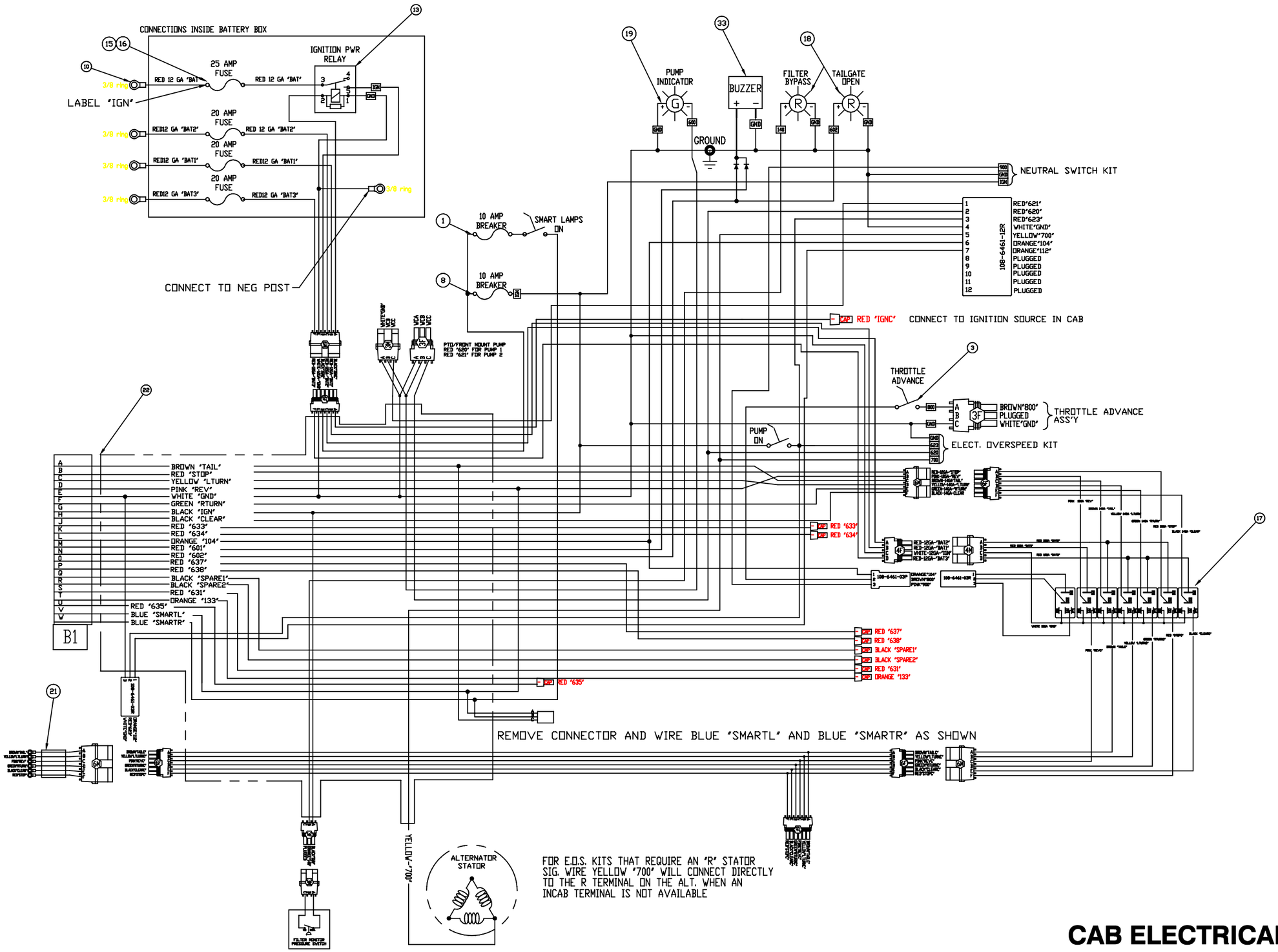


CAB ELECTRICAL KIT
DP5000 - LED
372-2850-led

CAB ELECTRICAL KIT - LED
372-2850-led

REF	PART NO.	DESCRIPTION	REQ'D
2	108-0880	SPADE	2
3	108-1814	SWITCH, toggle	2
4	108-2050	SPADE – 3/16"	6
5	108-2648	DIODE	9
6	108-3647	CONNECTOR, closed end	2
7	108-4476	LOOM	12 ft
8	108-4867-005	BREAKER, circuit – 10 A	1
9	108-4943-003	RING, terminal - #10	6
10	108-4943-006	TERMINAL, ring – 3/8"	5
11	108-5717-002	CONNECTOR, butt	8
12	108-5717-003	CONNECTOR, butt	6
13	108-6752	RELAY	1
14	108-7112-020	FUSE - 20 AMP	3
15	108-7112-025	FUSE – 25 AMP	1
16	108-7790	HOLDER, fuse	4
17	108-7811-001	STRIP, relay	1
18	115-0766	LIGHT, indicator – red	2
	115-0766-002	BULB	1
	115-0766-003	LENS	1
19	115-0886	LIGHT, indicator – green	1
	115-0766-002	BULB	1
	115-0886-003	LENS	1
20	212-2680	DECAL, control	1
21	263-0075	HARNESS, light wire	1
22	263-1225	HARNESS, cab to body wire	1
23	108-4827-112	TERMINAL, male	12
24	108-4827-121	TERMINAL, female	3
25	108-4827-122	TERMINAL, female	10
26	108-4827-006	CONNECTOR, 3-way female	1
27	108-4827-008	CONNECTOR, 4-way female	1
28	108-4827-009	CONNECTOR, 6-way female	4
29	108-4827-130	SEAL, cable	19
30	108-4827-134	PLUG, cavity	1
31	108-7114-010	DISCONNECT, female quick	8
32	108-6461-010	RECEPTICLE, 12-way	1
33	108-0147	BUZZER	1

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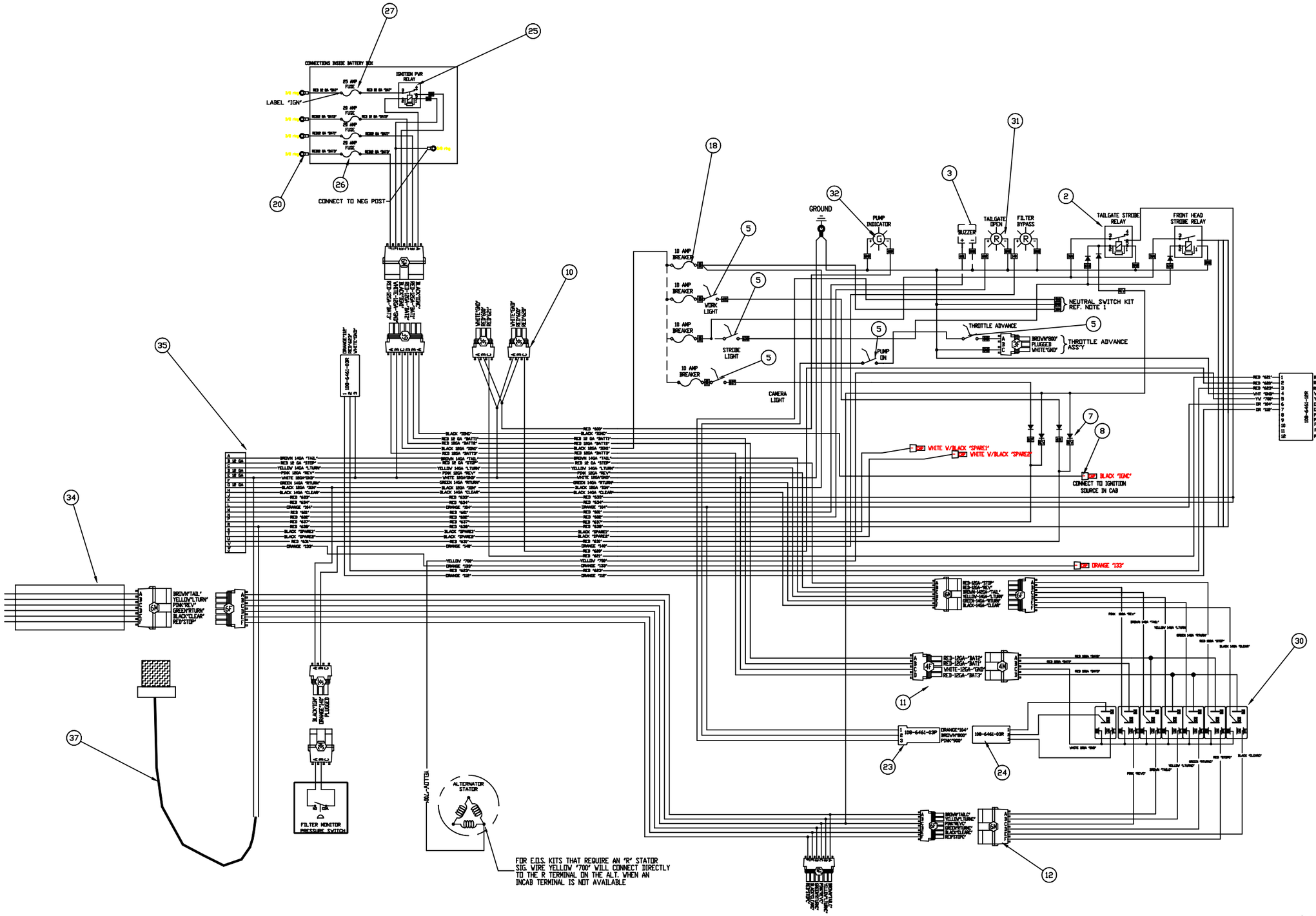


CAB ELECTRICAL KIT
DP5000 LED - SMART LIGHTS
372-2850-SMT

CAB ELECTRICAL KIT – SMART LIGHTS
372-2850-smt

REF	PART NO.	DESCRIPTION	REQ'D
1	108-4867-005	BREAKER, circuit – 10 A	1
2	108-0880	SPADE	2
3	108-1814	SWITCH, toggle	3
4	108-2050	SPADE – 3/16"	6
5	108-2648	DIODE	1
6	108-3647	CONNECTOR, closed end	2
7	108-4476	LOOM	12 ft
8	108-4867-005	BREAKER, circuit – 10 A	1
9	108-4943-003	RING, terminal - #10	6
10	108-4943-006	TERMINAL, ring – 3/8"	5
11	108-5717-002	CONNECTOR, butt	8
12	108-5717-003	CONNECTOR, butt	6
13	108-6752	RELAY	1
14	108-7112-020	FUSE - 20 AMP	3
15	108-7112-025	FUSE – 25 AMP	1
16	108-7790	HOLDER, fuse	4
17	108-7811-001	STRIP, relay	1
18	115-0766	LIGHT, indicator – red	2
	115-0766-002	BULB	1
	115-0766-003	LENS	1
19	115-0886	LIGHT, indicator – green	1
	115-0766-002	BULB	1
	115-0886-003	LENS	1
20	212-2876	DECAL, control	1
21	263-0075	HARNESS, light wire	1
22	263-1225	HARNESS, cab to body wire	1
23	108-4827-112	TERMINAL, male	12
24	108-4827-121	TERMINAL, female	3
25	108-4827-122	TERMINAL, female	10
26	108-4827-006	CONNECTOR, 3-way female	1
27	108-4827-008	CONNECTOR, 4-way female	1
28	108-4827-009	CONNECTOR, 6-way female	2
29	108-4827-130	SEAL, cable	19
30	108-4827-134	PLUG, cavity	1
31	108-7114-010	DISCONNECT, female quick	8
33	108-0147	BUZZER	1

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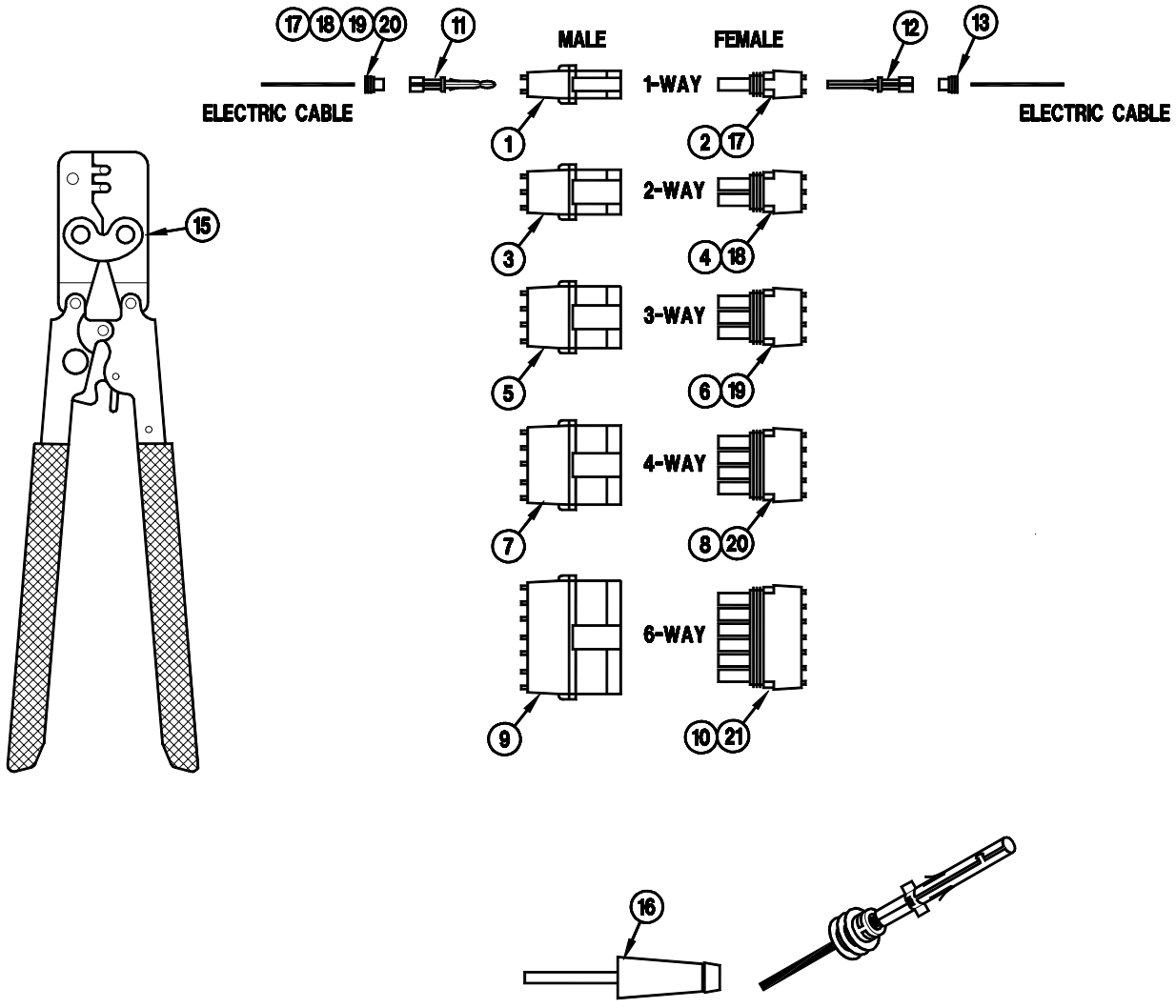
CAB ELECTRICAL KIT
DP5000 - ALLIED
372-1797

CAB ELECTRICAL KIT - ALLIED
372-1797

REF	PART NO.	DESCRIPTION	REQ'D
1	054-7350	TUBE, shrink	25 inches
2	069-0032	RELAY, micro	3
3	108-0147	BUZZER	1
4	108-0880	SPADE	2
5	108-1814	SWITCH, toggle	2
6	108-2050	SPADE – 3/16"	6
7	108-2648	DIODE	9
8	108-3647	CONNECTOR, closed end	2
9	108-4476	LOOM	12 ft
10	108-4827-006	CONNECTOR, 3-way female	1
11	108-4827-008	CONNECTOR, 4-way female	1
12	108-4827-009	CONNECTOR, 6-way female	4
13	108-4827-112	TERMINAL, male	24
14	108-4827-121	TERMINAL, female	34
15	108-4827-122	TERMINAL, female	30
16	108-4827-130	SEAL, cable	80
17	108-4827-134	PLUG, cavity	2
18	108-4867-005	BREAKER, circuit – 10 A	3
19	108-4943-003	RING, terminal - #10	12
20	108-4943-006	TERMINAL, ring – 3/8"	5
21	108-5717-002	CONNECTOR, butt	6
22	108-5717-003	CONNECTOR, butt	5
23	108-6461-001	PLUG, 3-way	1
24	108-6461-002	PLUG, 4-way	1
25	108-6752	RELAY	2
26	108-7112-020	FUSE - 20 AMP	3
27	108-7112-025	FUSE – 25 AMP	1
28	108-7114-010	DISCONNECT, female quick	8
29	108-7790	HOLDER, fuse	4
30	108-7811-001	STRIP, relay	1
31	115-0766	LIGHT, indicator – red	2
	115-0766-002	BULB	1
	115-0766-003	LENS	1
32	115-0886	LIGHT, indicator – green	1
	115-0766-002	BULB	1
	115-0886-003	LENS	1
33	212-2680	DECAL, control	1
34	263-0075	HARNESS, light wire	1
35	263-1044	HARNESS, cab to body wire	1
36	311-2049	BRACKET	1
37	372-0867-005	STROBE KIT	1

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PACKARD CONNECTION KIT
108-4827



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PACKARD CONNECTION KIT
108-4827

REF	PART NO.	DESCRIPTION	REQ'D
1	108-4827-001	CONNECTION, 1-way male	20
2	108-4827-002	CONNECTION, 1-way female	20
3	108-4827-003	CONNECTION, 2-way male	20
4	108-4827-004	CONNECTION, 2-way female	20
5	108-4827-005	CONNECTION, 3-way male	20
6	108-4827-006	CONNECTION, 3-way female	20
7	108-4827-007	CONNECTION, 4-way male	20
8	108-4827-008	CONNECTION, 4-way female	20
9	108-4827-009	CONNECTION, 6-way male	20
10	108-4827-010	CONNECTION, 6-way female	20
11	108-4827-110	TERMINAL, male (18-20 AWG)	60
	108-4827-111	TERMINAL, male (16-14 AWG)	200
	108-4827-112	TERMINAL, male (10-12 AWG)	60
12	108-4827-120	TERMINAL, female (18-20 AWG)	60
	108-4827-121	TERMINAL, female (16-14 AWG)	200
	108-4827-122	TERMINAL, female (10-12 AWG)	60
13	108-4827-130	SEAL, cable – (20 GA)	20
	108-4827-131	SEAL, cable – (18 GA)	100
	108-4827-132	SEAL, cable – (16-14 GA)	400
	108-4827-133	SEAL, cable – (12 GA)	100
14	108-4827-134	PLUG, cavity	20
15	108-4828-001	TOOL, installation	1
16	108-4828-002	TOOL, removal	1
17	108-4827-014	SEAL, 1-way female connection	A/R
18	108-4827-015	SEAL, 2-way female connection	A/R
19	108-4827-016	SEAL, 3-way female connection	A/R
20	108-4827-017	SEAL, 4-way female connection	A/R
21	108-4827-018	SEAL, 6-way female connection	A/R

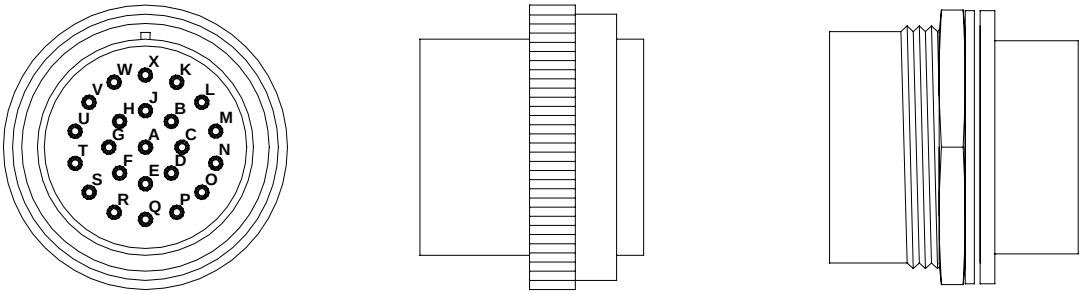
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DEUTSCH CONNECTION KIT
108-6461-PC

REF	PART NO.	DESCRIPTION	REQ'D
1	108-6461-03P	PLUG, 3-way	15
2	108-6461-3PW	WEDGE, 3-way plug	15
3	108-6461-03R	RECEPTICLE, 3-way	15
4	108-6461-3RW	WEDGE, 3-way recepticle	15
5	108-6461-04P	PLUG, 4-way	3
6	108-6461-4PW	WEDGE, 4-way plug	3
7	108-6461-04R	RECEPTICLE, 4-way	3
8	108-6461-4RW	WEDGE, 4-way recepticle	3
9	108-6461-06P	PLUG, 6-way	3
10	108-6461-6PW	WEDGE, 6-way plug	3
11	108-6461-06R	RECEPTICLE, 6-way	3
12	108-6461-6RW	WEDGE, 6-way recepticle	3
13	108-6461-08P	PLUG, 8-way	3
14	108-6461-8PW	WEDGE, 8-way plug	3
15	108-6461-08R	RECEPTICLE, 8-way	3
16	108-6461-8RW	WEDGE, 8-way recepticle	3
17	108-6461-12P	PLUG, 12-way	3
18	108-6461-12PW	WEDGE, 12-way plug	3
19	108-6461-12R	RECEPTICLE, 12-way	3
20	108-6461-CRW	WEDGE, 12-way recepticle	3
21	108-6461-100	PLUG, sealing	25
22	108-6461-101	PIN, gold plated	200
23	108-6461-102	SOCKET, gold plated	200
24	108-6461-201	CRIMPER	1
25	108-6461-202	TOOL, removal	1

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CONNECTORS, PLUGS, PINS and ACCESSORIES for DEUTSCH ELECTRICAL PARTS 108-4815



PINS & SOCKETS

HEIL PART NUMBER	DESCRIPTION
108-4815-101	PIN (6 GA)
108-4815-102	SOCKET (6 GA)
108-4815-103	SEALING PLUG (6 GA)
108-4815-104	PIN (8-10 GA)
108-4815-105	SOCKET (8-10 GA)
108-4815-106	SEALING PLUG (8-10 GA)
108-4815-107	PIN (12-14 GA)
108-4815-108	SOCKET (12-14 GA)
108-6461-100	SEALING PLUG (12-14 GA)
108-4815-110	PIN (16-18 GA)
108-4815-111	SOCKET (16-18 GA)
108-6461-100	SEALING PLUG (16-18 GA)
108-4815-112	PIN (20-24 GA)
108-4815-113	SOCKET (20-24 GA)
108-4815-114	SEALING PLUG (20-24 GA)

GOLD PINS & SOCKETS

HEIL PART NUMBER	DESCRIPTION
108-4815-120	PIN (12-14 GA)
108-6461-121	SOCKET (12-14 GA)
108-4815-124	PIN (14-16 GA)
108-4815-125	SOCKET (14-16 GA)
108-6461-122	PIN (16-18 GA)
108-4815-123	SOCKET (16-18 GA)
108-4815-126	PIN (20-24 GA)
108-4815-127	SOCKET (20-24 GA)

PLASTIC CONNECTOR SHELLS

108-4815-020	21 (PIN) RECEPTACLE
108-4815-021	21 (SOCKET) PLUG
108-4815-022	19 (PIN) RECEPTACLE
108-4815-023	19 (SOCKET) PLUG
108-4815-024	23 (PIN) RECEPTACLE
108-4815-025	23 (SOCKET) PLUG

ACCESSORIES

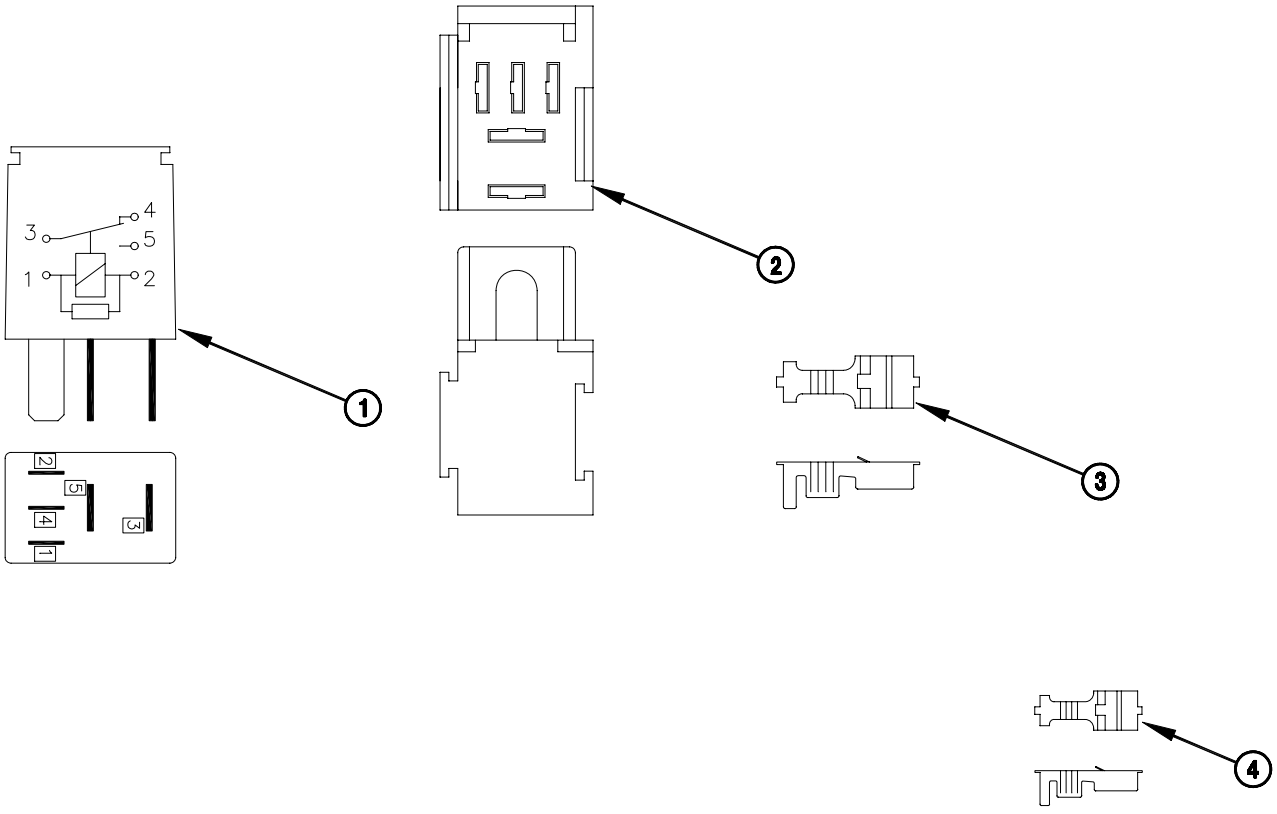
HEIL PART NUMBER	DESCRIPTION
108-4815-150	PANEL NUT, 24 SHELL
108-4815-151	LOCKWASHER, 24 SHELL
108-4815-152	STRAIN RELIEF STRAIGHT 24
108-4815-153	STRAIN RELIEF °90 24
108-4815-154	PANEL NUT, 18 SHELL
108-4815-155	LOCKWASHER, 18 SHELL
108-4815-156	STRAIN RELIEF STRAIGHT 18
108-4815-157	STRAIN RELIEF °90 18
108-4815-158	REMOVAL TOOL (6 GA)
108-4815-159	REMOVAL TOOL (8-10 GA)
108-4815-160	REMOVAL TOOL (12-14 GA)
108-4815-161	REMOVAL TOOL (16-18 GA)
108-4815-162	REMOVAL TOOL (20-24 GA)
108-4815-163	CRIMP TOOL (12-24 GA)
108-4815-164	CRIMP TOOL (6-10 GA)
108-4815-165	RECEPTACLE CAP, 18 PIN
108-4815-166	RECEPTACLE CAP, 24 PIN
108-4815-167	PLUG CAP, 18 PIN
108-4815-168	PLUG CAP, 24 PIN
108-4815-169	- - - -
108-4815-170	DT SCREWDRIVER TOOL

METAL CONNECTOR SHELLS

HEIL PART NUMBER	DESCRIPTION
108-4815-001	21 (PIN) RECEPTACLE
108-4815-002	21 (SOCKET) PLUG
108-4815-003	31 (PIN) RECEPTACLE
108-4815-004	31 (SOCKET) PLUG
108-4815-005	23 (PIN) RECEPTACLE
108-4815-006	23 (SOCKET) PLUG
108-4815-007	16 (PIN) RECEPTACLE
108-4815-008	16 (SOCKET) PLUG
108-4815-009	14 (PIN) RECEPTACLE (16 GA)
108-4815-010	14 (SOCKET) PLUG (16 GA)
108-4815-015	35 (PIN) RECTL(3-16GA, 32-20GA)
108-4815-016	35 (SOC) PLUG(3-16GA, 32-20GA)

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MICRO RELAY KIT
069-0032



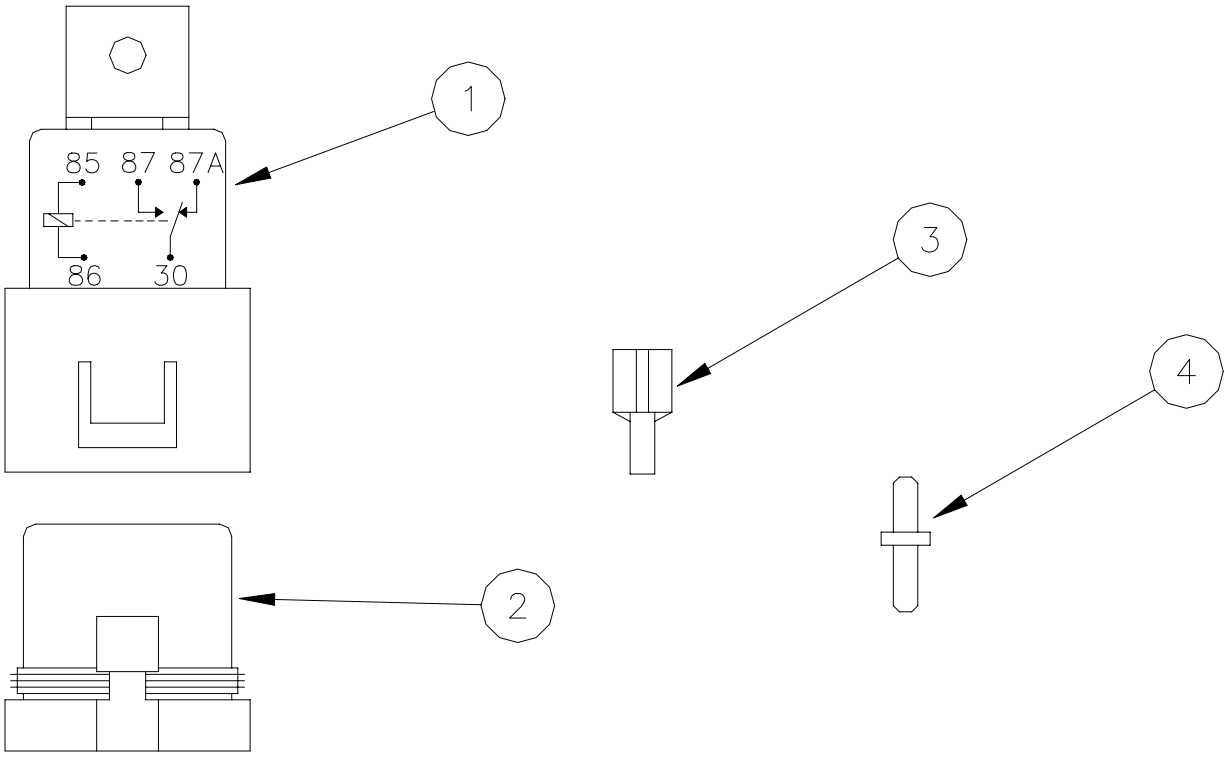
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MICRO RELAY KIT
069-0032

REF	PART NO.	DESCRIPTION	REQ'D
1	069-0032-001	RELAY – 12V	1
2	069-0032-002	CONNECTOR	1
3	069-0032-003	TERMINAL – 1/4"	2
4	069-0032-004	TERMINAL – 3/16"	3

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WEATHER PROOF RELAY
108-6752



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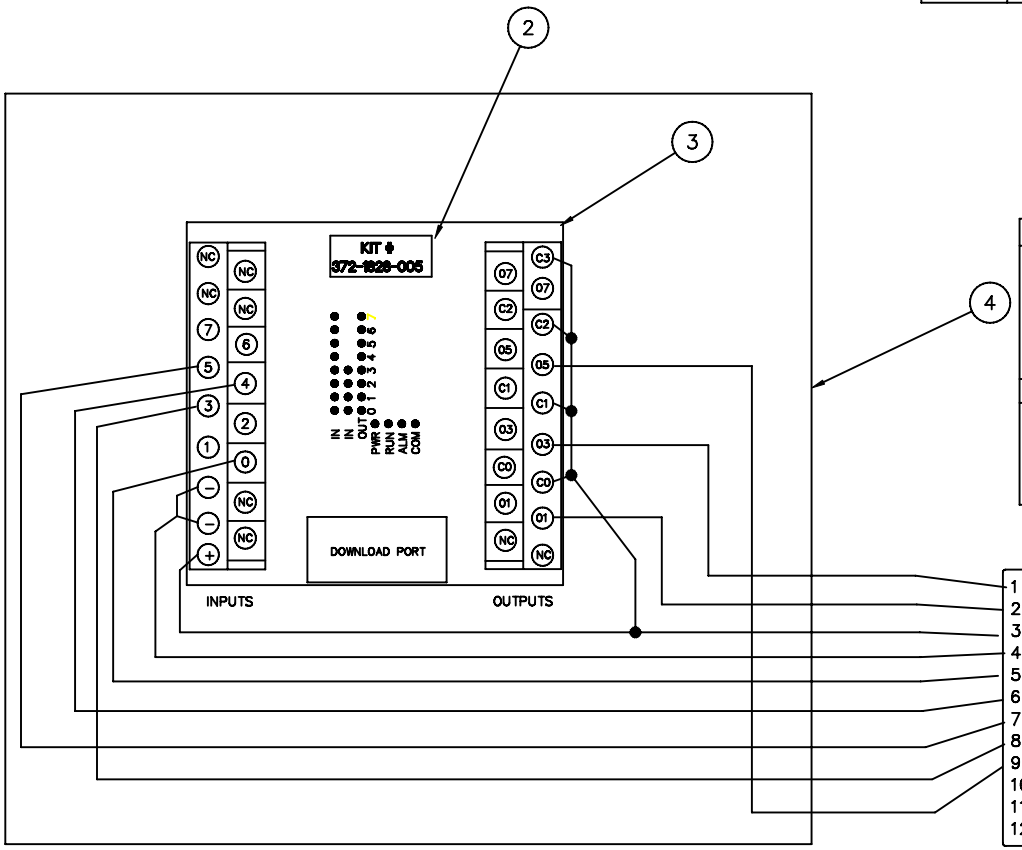
WEATHER PROOF RELAY
108-6752

REF	PART NO.	DESCRIPTION	REQ'D
1	108-6752-001	RELAY	1
2	108-6752-002	CONNECTOR	1
3	108-6752-003	TERMINAL	4
4	108-6752-004	PLUG	1

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CALIBRATION INSTRUCTIONS
PLACE A JUMPER ACROSS INPUTS 0.01 AND 0.02. HOLD THE THROTTLE AT 1000 RPM. AFTER 10 SECONDS OUTPUT 10.07 WILL LIGHT. THIS INDICATES THE CALIBRATION PROCESS IS COMPLETE. REMOVE THE JUMPER.

REF.	PART No.	DESCRIPTION	QTY.
1	. 109-0205-001	PLC PROGRAM	REF
2	. 212-2784-009	DECAL	1
3	. 108-7860	PLC OMRON MINI	1
4	. 372-1906	KIT BOX MINI PLC	1



4

INPUTS	
0.00	R-STATOR
0.01	CALIBRATION
0.02	CALIBRATION
0.03	TRANS TEMP
0.04	THROTTLE ADV
0.05	PRESSURE SWITCH
OUTPUTS	
10.01	PRIMARY PUMP
10.03	SECONDARY PUMP
10.05	CHIMES
10.07	CAL SET INDICATOR

PUMP OPERATION
PUMP 1 MAX ENGAGEMENT SPEED 1800 RPM
PUMP 1 MAX OPERATING SPEED 2000 RPM
PUMP 2 MAX ENGAGEMENT SPEED 800 RPM
PUMP 2 MAX OPERATING SPEED 800 RPM

PUMP 2 WILL DROP OUT WITH THE LOW TORQUE PRESSURE SWITCH OR HIGH TRANSMISSION TEMP SWITCH.

PUMP 1 WILL DROP OUT WITH THE HIGH TRANSMISSION TEMP SWITCH OR WHEN THE ENGINE DROOP LIMIT IS REACHED.

CONNECT TO 12 WAY DEUTSCH CONNECTOR IN CAB.

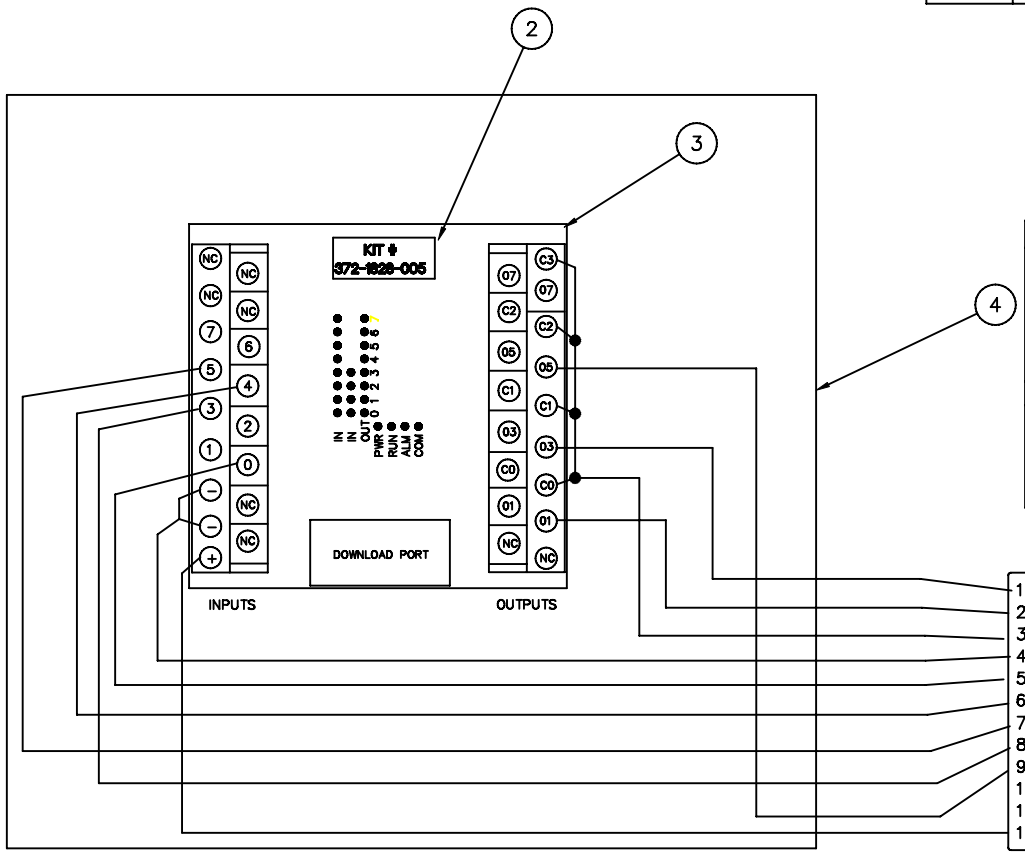
108-6461-12P

1	RED"621"
2	RED"620"
3	RED"623"
4	WHITE"GND"
5	YELLOW"700"
6	ORANGE"104"
7	ORANGE"112"
8	PINK"904"
9	RED"650"
10	PLUGGED
11	PLUGGED
12	PLUGGED

MINI PLC KIT
REAR LOADER O-I-G-A-I
372-1828-006

CALIBRATION INSTRUCTIONS
PLACE A JUMPER ACROSS INPUTS 0.01 AND 0.02. CONNECT 12 VOLT IGNITION SOURCE TO JUMPER. HOLD THE THROTTLE AT 1000 RPM. AFTER 10 SECONDS OUTPUT 10.07 WILL LIGHT. THIS INDICATES THE CALIBRATION PROCESS IS COMPLETE. REMOVE THE JUMPER.

REF.	PART No.	DESCRIPTION	QTY.
1	. 109-0224	PLC PROGRAM	REF
2	. 212-2784-009	DECAL	1
3	. 108-7860	PLC OMRON MINI	1
4	. 372-1906	KIT BOX MINI PLC	1



INPUTS	
0.00	R-STATOR
0.01	CALIBRATION
0.02	CALIBRATION
0.03	TRANS TEMP
0.04	THROTTLE ADV
0.05	PRESSURE SWITCH
OUTPUTS	
10.01	PRIMARY PUMP
10.03	SECONDARY PUMP
10.05	CHIMES
10.07	CAL SET INDICATOR

PUMP OPERATION
PUMP 1 MAX ENGAGEMENT SPEED 1000 RPM
PUMP 1 MAX OPERATING SPEED 1050 RPM
PUMP 2 MAX ENGAGEMENT SPEED 1000 RPM
PUMP 2 MAX OPERATING SPEED 1050 RPM

PUMP 2 WILL DROP OUT WITH HIGH TRANSMISSION TEMP SWITCH.

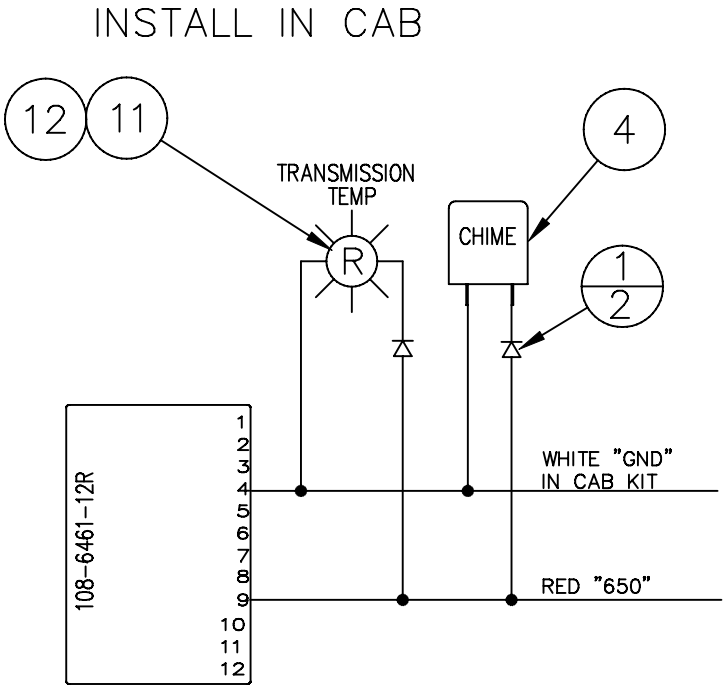
PUMP 1 WILL DROP OUT WITH THE HIGH TRANSMISSION TEMP SWITCH OR WHEN THE ENGINE DROP LIMIT IS REACHED.

CONNECT TO 12 WAY DEUTSCH CONNECTOR IN CAB.

108-6461-12P

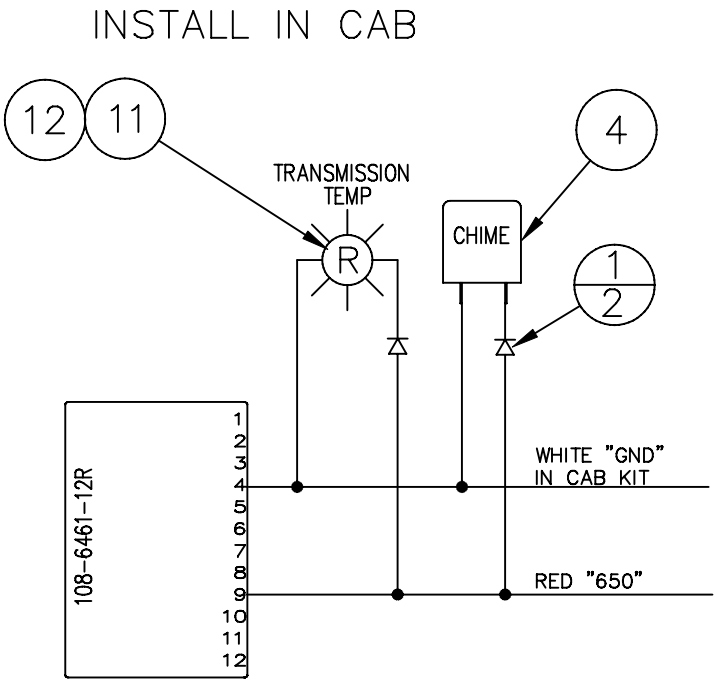
1	RED"621"
2	RED"620"
3	RED"623"
4	WHITE"GND"
5	YELLOW"700"
6	ORANGE"104"
7	ORANGE"112"
8	PINK"904"
9	RED"650"
10	PLUGGED
11	PLUGGED
12	BLACK"IGN"

MINI PLC KIT
REAR LOADERS O-A-I
LOW E.O.S.
372-1828-008



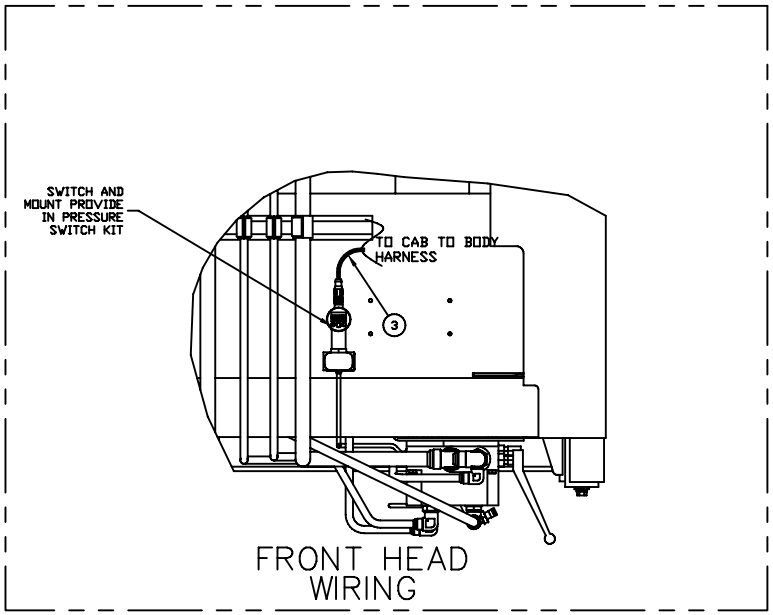
REF.	PART No.	DESCRIPTION	QTY.
1	. 108-5632	DIODE	2
2	. 108-5717-001	CONNECTOR BUTT 18 GA	2
3	. 108-5717-002	CONNECTOR BUTT 16 GA	2
4	. 108-6189	CHIME	1
5	. 108-6461-101	PIN	1
6	. 108-6716-GND	WIRE 16 GA	36"
7	. 108-6718-904	WIRE 18 GA	36"
8	. 108-7583-038	HEAT SHRINK 3/8"	10"
9	. 108-7799	SWITCH TRANSMISSION TEMP	1
10	. 108-7919-004	KIT PRESSURE SWITCH, OIGAI	1
11	. 115-0766	LIGHT INDICATOR RED	1
12	. 212-2886-001	DECAL TRANS TEMP	1
13	. 212-2886-002	DECAL SYSTEM SPEED UP	3
14	. 372-1828-006	KIT MINI-PLC	1

OPERATE-AT-IDLE ELECTRICAL KIT
372-2961

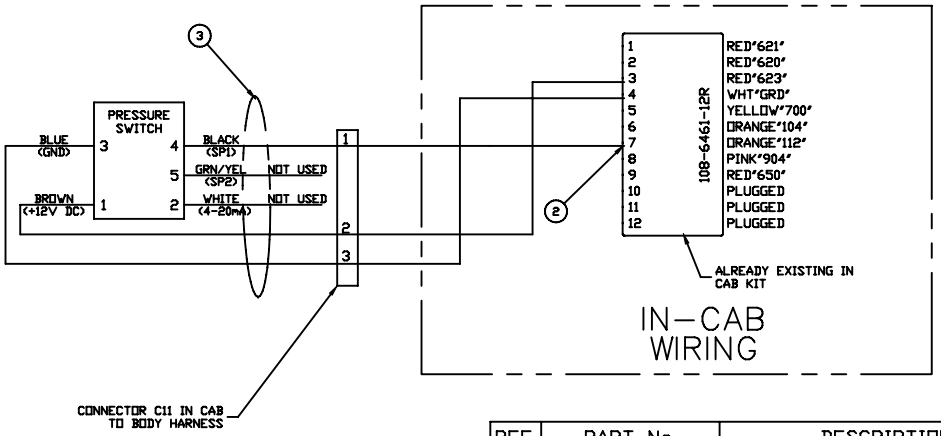


REF.	PART No.	DESCRIPTION	QTY.
1	. 108-5632	DIODE	2
2	. 108-5717-001	CONNECTOR BUTT 18 GA	2
3	. 108-5717-002	CONNECTOR BUTT 16 GA	2
4	. 108-6189	CHIME	1
5	. 108-6461-101	PIN	1
6	. 108-6716-GND	WIRE 16 GA	36"
7	. 108-6718-904	WIRE 18 GA	36"
8	. 108-7583-038	HEAT SHRINK 3/8"	10"
9	. 108-7799	SWITCH TRANSMISSION TEMP	1
10	. 108-7919-004	KIT PRESSURE SWITCH, OIGAI	1
11	. 115-0766	LIGHT INDICATOR RED	1
12	. 212-2886-001	DECAL TRANS TEMP	1
13	. 212-2886-002	DECAL SYSTEM SPEED UP	3
14	. 372-1828-008	KIT MINI-PLC	1

OPERATE-AT-IDLE ELECTRICAL KIT
372-2961-002



FRONT HEAD WIRING



IN-CAB WIRING

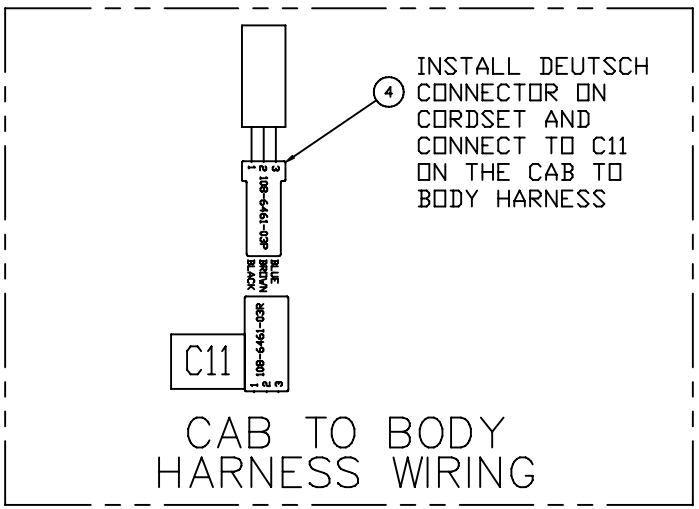
REF.	PART No.	DESCRIPTION	QTY.
1	. 054-7350	HEAT SHRINK	6"
2	. 108-6461-101	DEUTSCH PIN	1
3	. 108-7121-05M	CORD SET 5 WIRE (5M)	1
4	. 108-6461-001	DUETSCH PLUG 3 WAY	1
5	. 108-7583-075	HEAT SHRINK 3/4"	4"

NOTE: THIS KIT PROVIDES:

1. FOR THE DISENGAGING OF PUMP#1 WHEN SYSTEM PRESSURE REACHES THE PROGRAMMED PRESSURE SET POINT.
2. FOR THE REENGAGING OF PUMP#1 WHEN THE SYSTEM PRESSURE DROPS BELOW THE PROGRAMMED HYSTERESIS SET POINT.

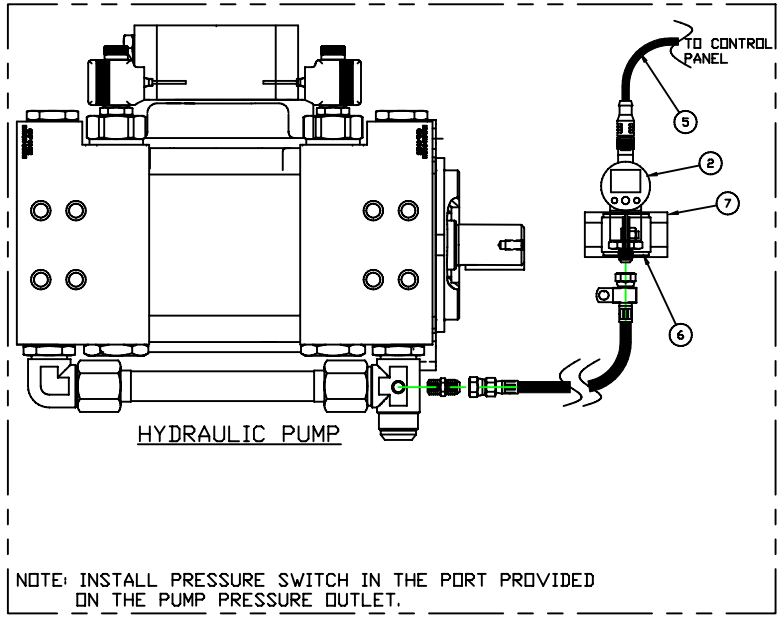
SETUP PROCEDURE

1. PRESS MODE BUTTON DURING POWER UP AND HOLD FOR 3 SECONDS UNTIL "MEnU" IS DISPLAYED.
2. PRESS AND RELEASE MODE BUTTON UNTIL "rAnG" IS DISPLAYED. USE ARROW BUTTON TO SET TO " PSI". (THIS SETTING CHANGES THE PRESSURE SWITCH TO READ IN PSI, DEFAULT IS BAR)
3. PRESS AND RELEASE MODE BUTTON UNTIL " End" IS DISPLAYED. USE ARROW BUTTONS TO SET TO "YES". (THIS STORES THE PROGRAM CHANGE)
4. WAIT 3 SECONDS, PRESS MODE BUTTON UNTIL ' SP 1' IS DISPLAYED. USE ARROW BUTTONS TO SET TO "2000". (THIS SETS SWITCH OUTPUT #1 TO TRIGGER AT 2000PSI).
5. PRESS AND RELEASE MODE BUTTON UNTIL "HYS 1" IS DISPLAYED. USE ARROW BUTTONS TO SET TO "700". (THIS SETS THE HYSTERESIS TO KEEP THE SWITCH TRIGGER UNTIL THE PRESSURE DROPS 700PSI BELOW THE VALUE IN SP1.
6. VERIFY OPERATION OF THE UNIT, IF THE ENGINE CONTINUES TO STALL DECREASE THE " SP 1" SET POINT IN INCREMENTS OF 100 UNTIL ENGINE NO LONGER STALLS.
7. VERIFY THAT THE PACKER PUMP DOES NOT DISENGAGE AND RENGAGE MULTIPLE TIMES WITH EACH PRESSURE SWITCH ACTIVATION. IF THIS DOES OCCUR DECREASE THE "HYS 1" SET POINT IN 100 PSI INCREMENTS UNTIL OCCURRENCES STOP.

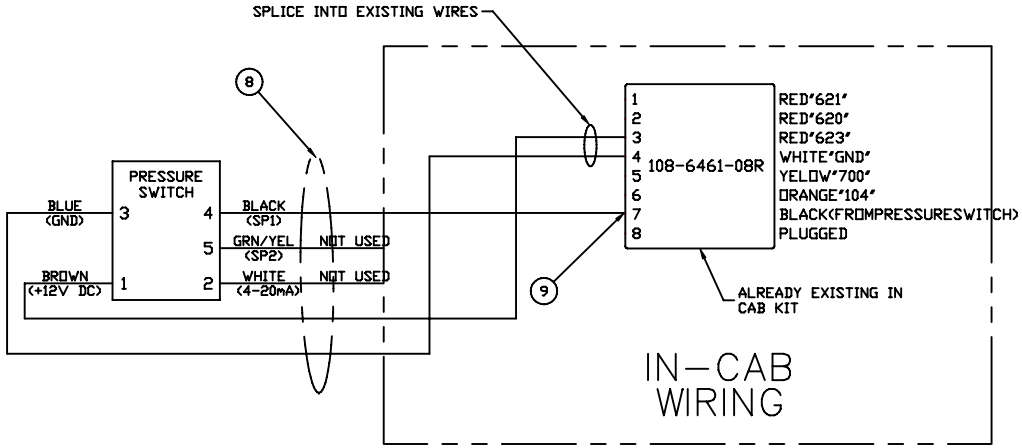


CAB TO BODY HARNESS WIRING

PRESSURE SWITCH KIT
REAR LOADER (O-I-G-A-I)
108-7919-004



REF.	PART No.	DESCRIPTION	QTY.
1	. 054-7350	HEAT SHRINK	6"
2	. 063-0114	PRESSURE SWITCH ELEC	1
3			
4			
5	. 108-7121-05M	CORD SET 5 WIRE (5M)	1
6	. 036-1474-009	TUBE CLAMP, 1 -1/4"	1
7	. 207-2938-006	CLAMP CHANNEL 3"	1
8			
9	. 108-6461-101	DEUTSCH PIN	1



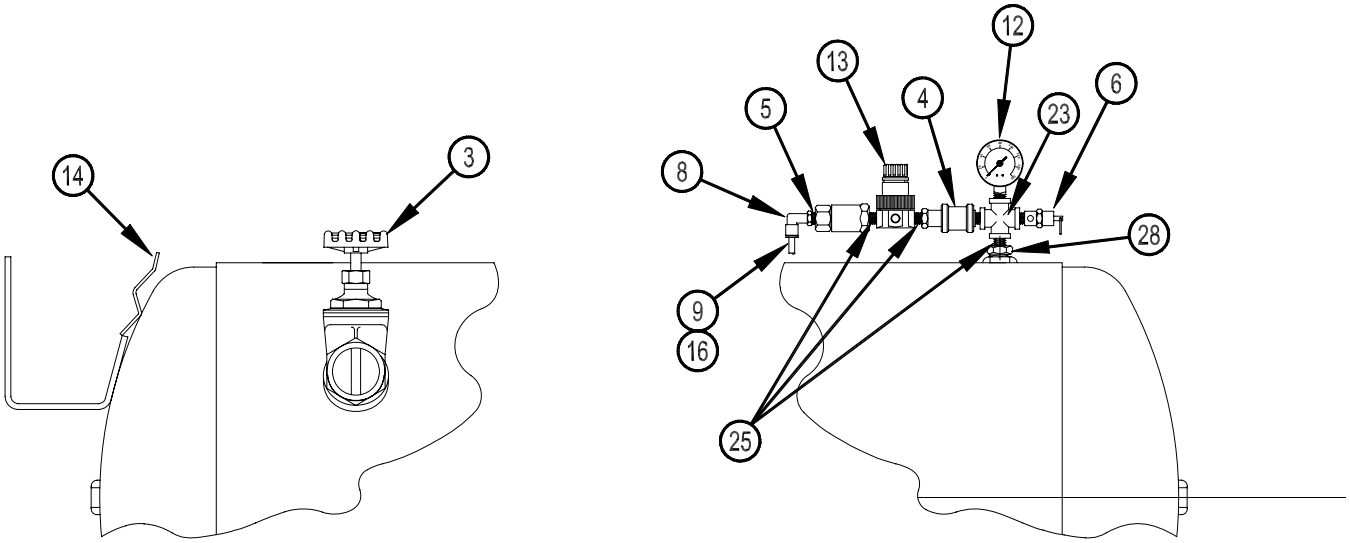
OPERATE-IN-GEAR-AT-IDLE PRESSURE SWITCH KIT
108-7919-001

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Buzzer Kit – Left Hand (372-1599) 7.7
Heavy Duty Contractors Kit (272-3851) 7.9
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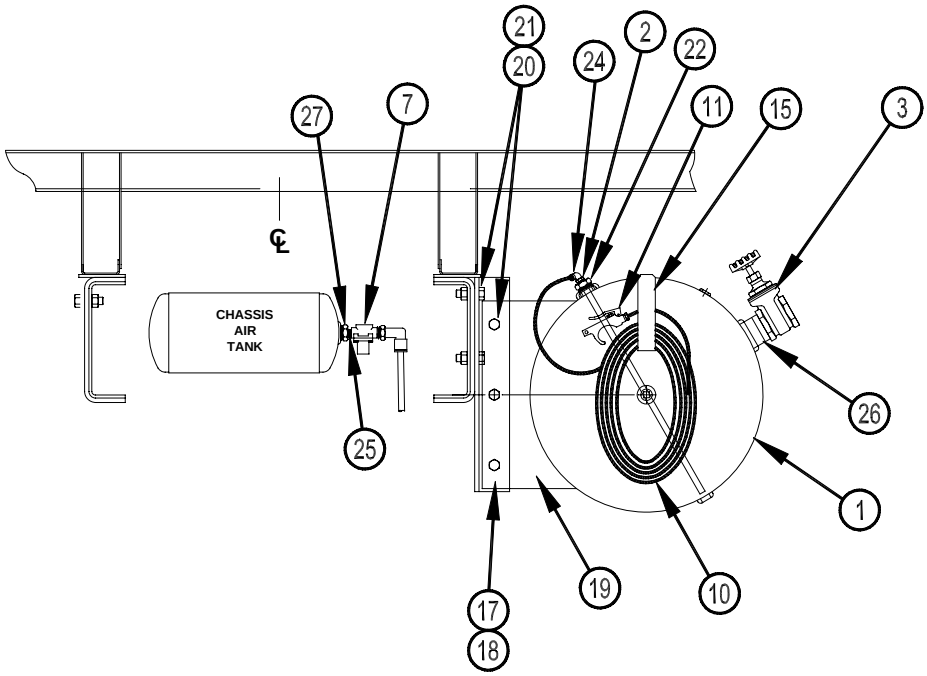
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WASHOUT TANK and PARTS
020-1251



DETAIL "B"

DETAIL "A"



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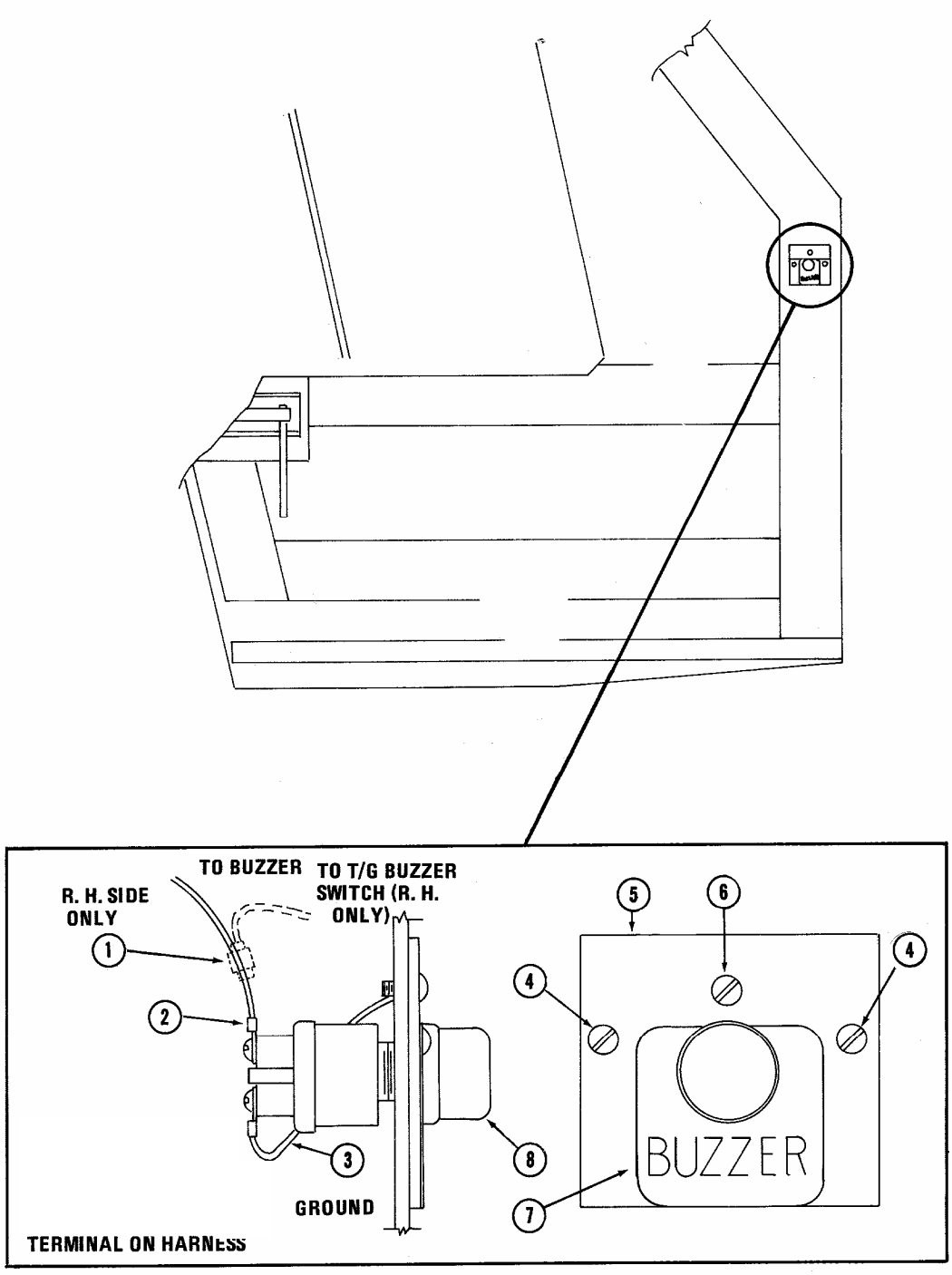
FORMULA 5000

WASHOUT TANK and PARTS
020-1251

REF	PART NO.	DESCRIPTION	REQ'D
1	020-1971	TANK, washout – 60 gal	1
2	058-8546	PIPE, feed	1
3	031-3421	VALVE, gate	1
4	031-3328	VALVE, slide	1
5	031-1307	VALVE, air check	1
6	031-1774	VALVE, safety	1
7	031-1909	VALVE, pressure protection	1
8	054-8470-004	ELBOW, 90° - 1/4"	1
9	054-5449	LINE, air – 1/4" OD	10ft
10	057-1255	HOSE	1
11	057-1256	GUN, blow	1
12	067-0606	GAUGE, pressure	1
13	067-0625	REGULATOR, pressure	1
14	111-6127-002	CLIP, hose	1
15	211-3798	BRACKET, hose	1
16	263-0045	LOOM – 3/8" ID	10ft
17	272-5095-001	BRACKET – left hand	1
18	272-5095-002	BRACKET – right hand	1
19	272-5095-003	BRACKET	2
20	FSP071324	CAPSCREW – 5/8" – 11NC x 1-1/2"	10
21	FSP231300	NUT, lock – 5/8" – 11NC	10
22	FS592011	BUSHING, reducing – 1" x 1/2"	1
23	FS690700	CROSS – 1/4" NPT	1
24	FS820700	ELBOW, street - 90° x 1/4"	1
25	FS880700	NIPPLE, close	5
26	FS883000	NIPPLE, close	1
27	FS600907	BUSHING, reducer	1
28	FS591507	BUSHING, reducer – 3/4" x 1/4"	1

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BUZZER KIT
108-3646 – RIGHT HAND



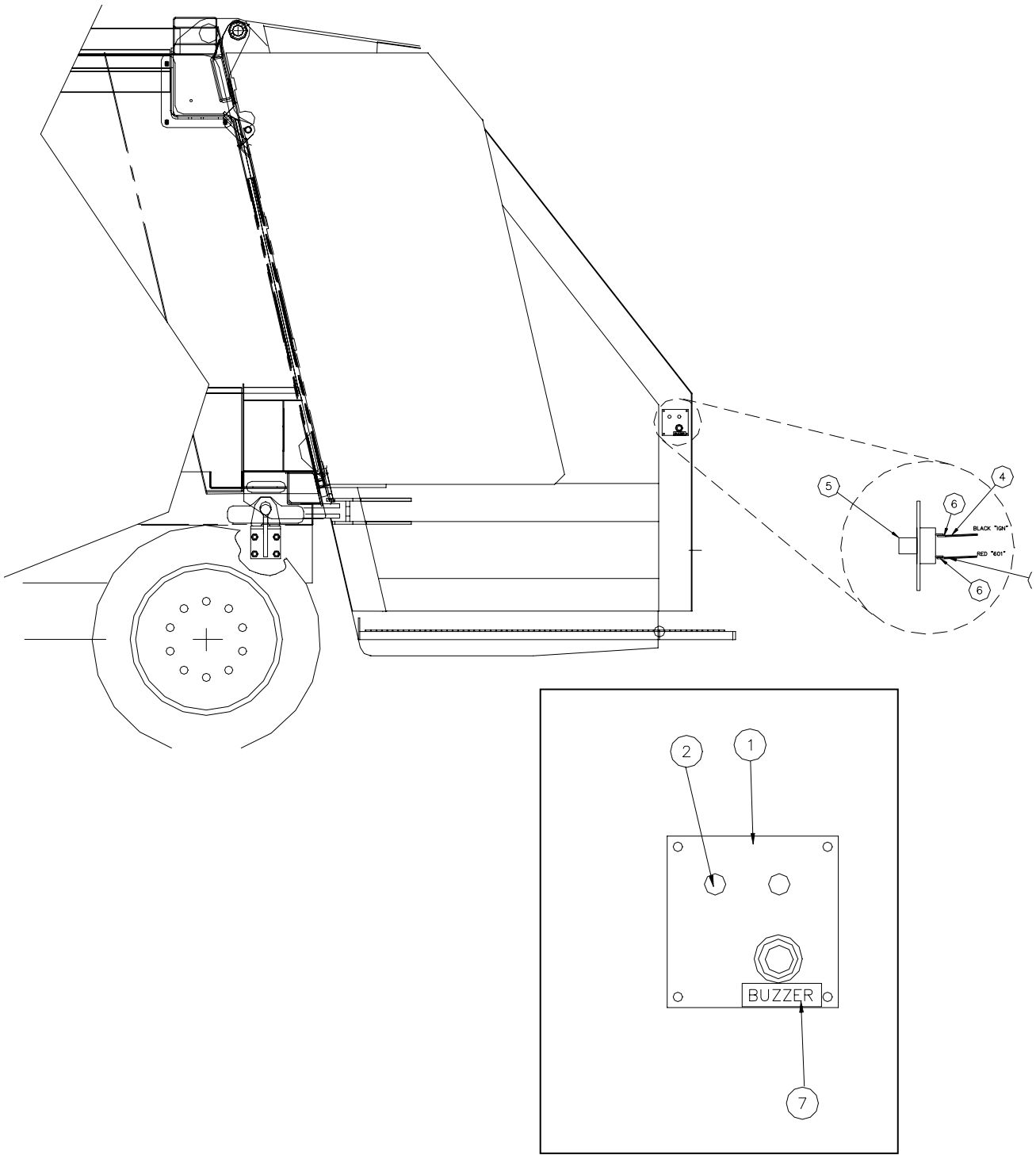
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BUZZER KIT
108-3646 – RIGHT HAND

REF	PART NO.	DESCRIPTION	REQ'D
1	108-1180	CONNECTOR – right hand only	1
2	108-0025	TERMINAL, ring	1
3	108-3648-001	WIRE, lead – blue	1
4	047-1435-001	TEK SCREW	2
5	134-5226	PLATE, mounting	1
	022-3108	GASKET	1
6	FS420313	SCREW, machine - #8 – 32 x 5/8"	1
	FS550300	WASHER, lock - #8	1
	NSS	NUT - #8 – 32	1
7	212-1549	PLATE, identification	1
8	108-1113	SWITCH	1

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LEFT HAND BUZZER KIT
372-1599



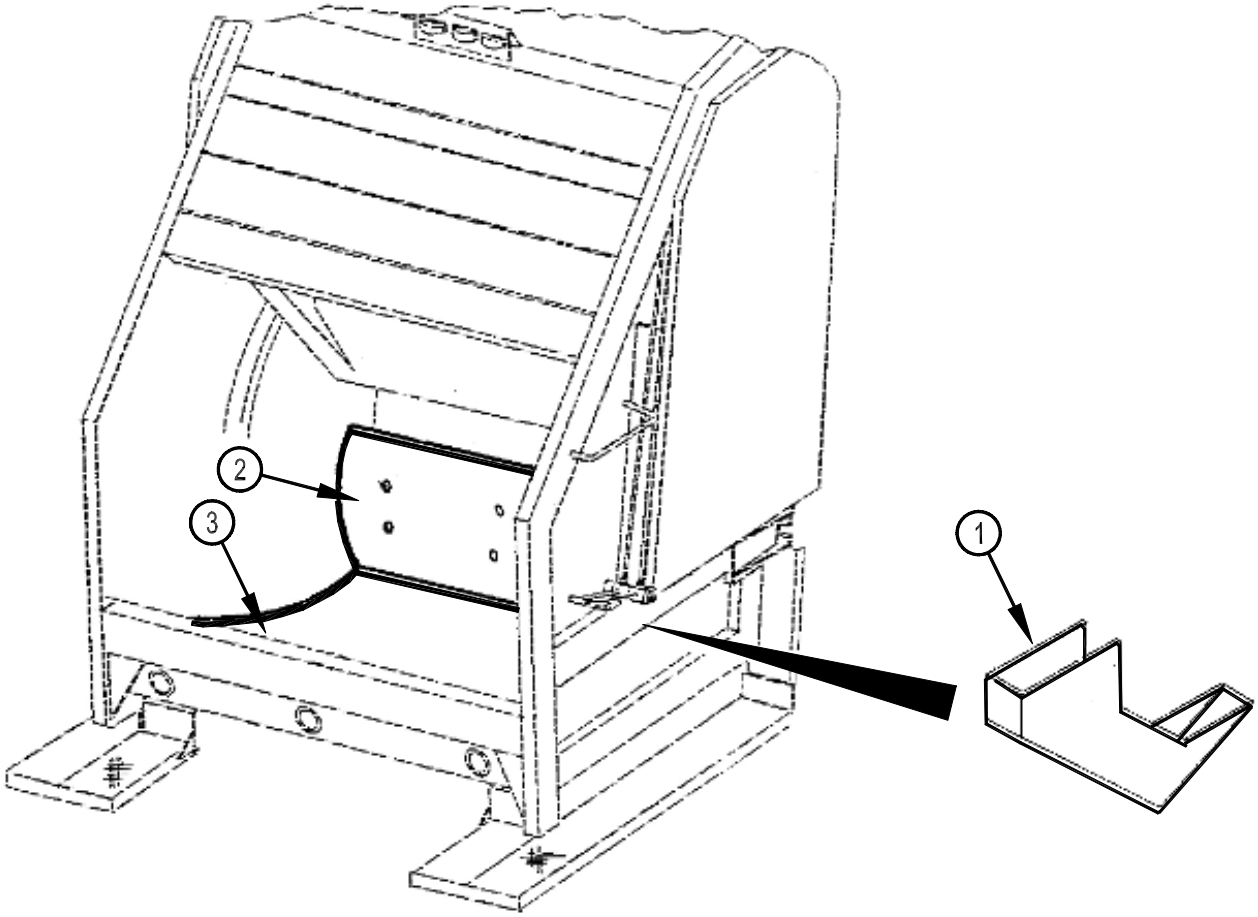
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LEFT HAND BUZZER KIT
372-1599

REF	PART NO.	DESCRIPTION	REQ'D
1	234-2137	COVER	1
2	025-0473-003	PLUG	2
3	047-2151-011	SCREW, tek	4
4	054-7350	TUBING, shrink	12 inches
5	108-1113	SWITCH	1
6	108-4943-002	TERMINAL, ring - #10	2
7	212-1903	DECAL	1

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HEAVY DUTY CONTRACTORS KIT
272-3851



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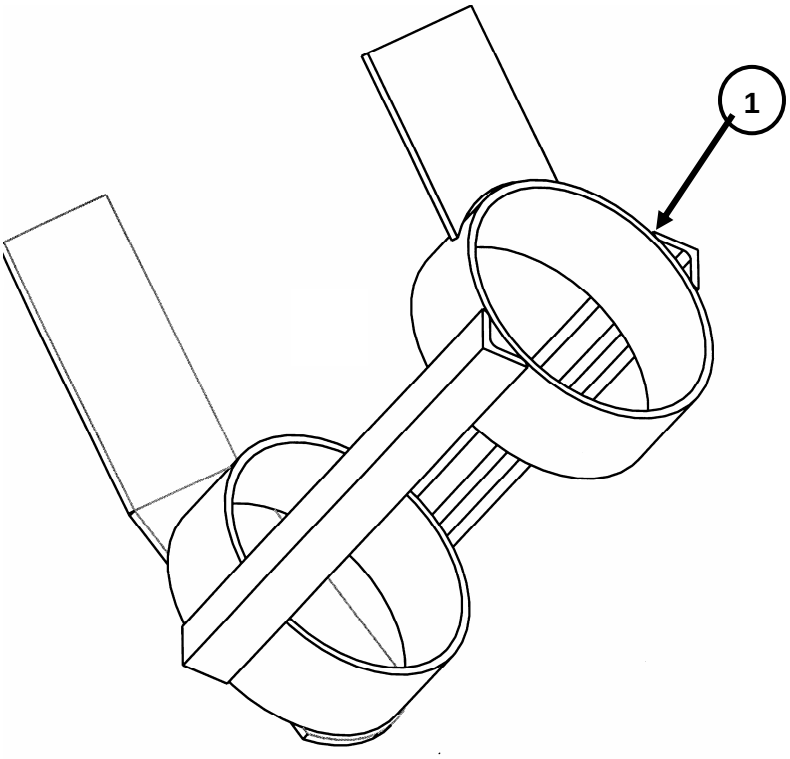
FORMULA 5000

HEAVY DUTY CONTRACTORS KIT
272-3851

REF	PART NO.	DESCRIPTION	REQ'D
1	272-3776	SIDE PAN KIT (see page 7.18)	1
2	094-1508	LINER, hopper front face	1
3	134-7849	BOTTOM, hopper	1

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FIRE EXTINGUISHER BRACKET



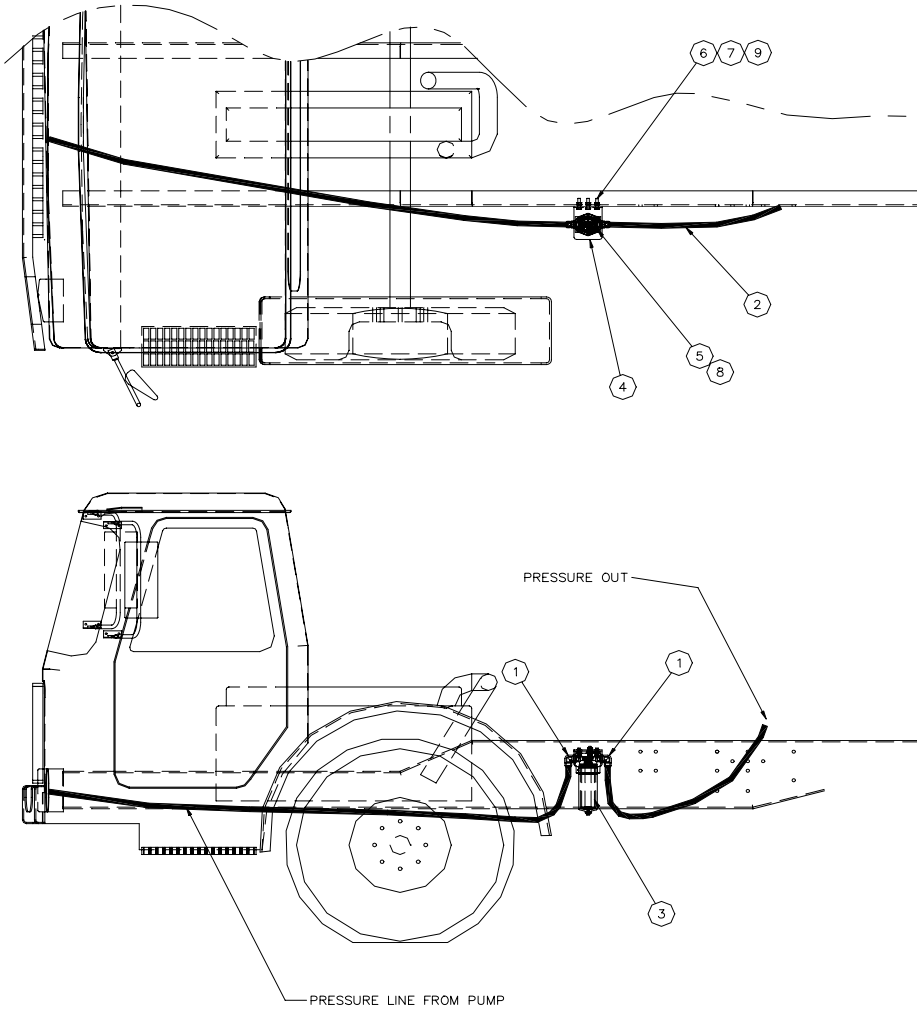
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FIRE EXTINGUISHER BRACKET

REF	PART NO.	DESCRIPTION	REQ'D
1	311-1571	HANGER, fire extinguisher	1
2	161-0345	EXTINGUISHER, fire – 20 Lb. (not shown)	1

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HIGH PRESSURE FILTER KIT
272-5082



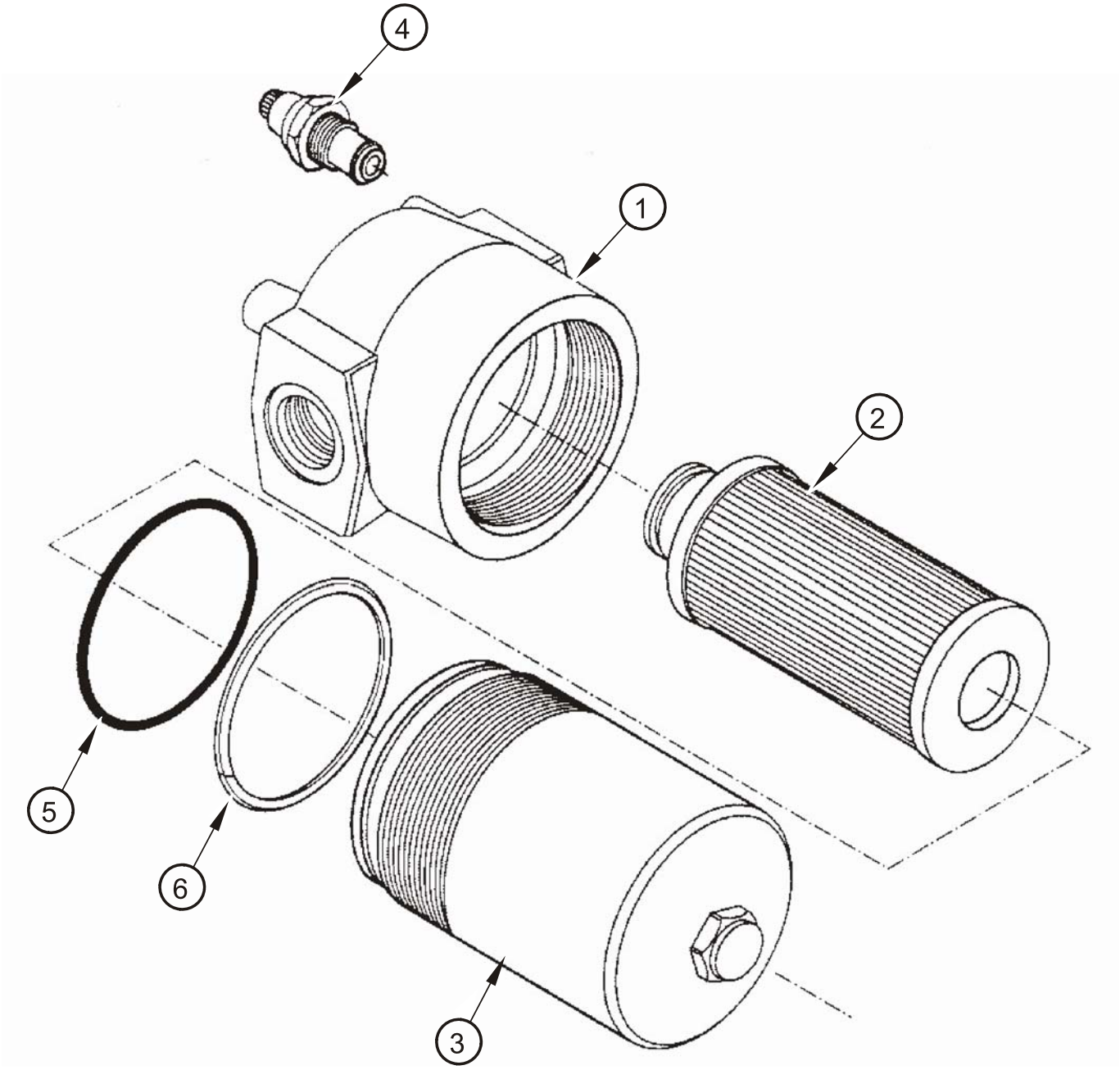
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HIGH PRESSURE FILTER KIT
272-5082

REF	PART NO.	DESCRIPTION	REQ'D
1	054-3340-010	ELBOW, 90°	2
2	057-1719-002	HOSE, hi-pressure – 1"	1
3	075-0930	FILTER, high pressure (see page 7.15)	1
4	311-3852	BRACKET, filter	1
5	FS070920	CAPSCREW – 3/8" – 16NC x 1"	4
6	FS071130	CAPSCREW – 1/2" – 13NC x 2"	3
7	FS231100	NUT, lock – 1/2" – 13NC	3
8	FS520900	WASHER, flat – 3/8"	4
9	FS521100	WASHER, flat – 1/2"	3

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HIGH PRESSURE OIL FILTER
075-0930



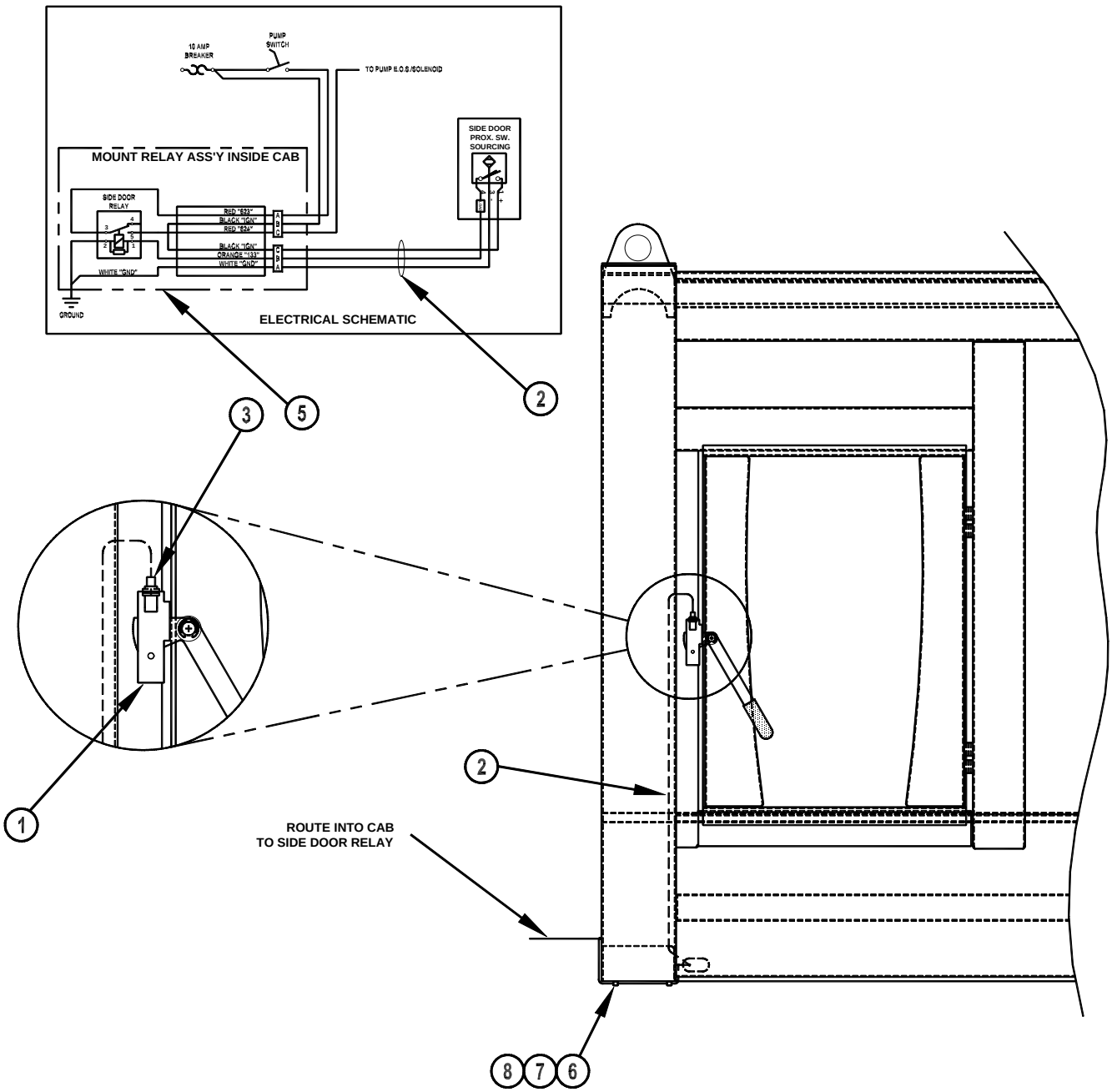
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HIGH PRESSURE OIL FILTER
075-0930

REF	PART NO.	DESCRIPTION	REQ'D
1	NSS	HEAD	1
2	075-0930-001	ELEMENT, filter	1
3	075-0930-002	BOWL	1
4	075-0730-003	INDICATOR	1
5	NSS	SEAL, bowl	1
6	NSS	RING, extrusion	1
-	075-0930-004	KIT, seal (consists of items 5, 6)	1

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SIDE DOOR PROXIMITY SWITCH KIT
372-0359



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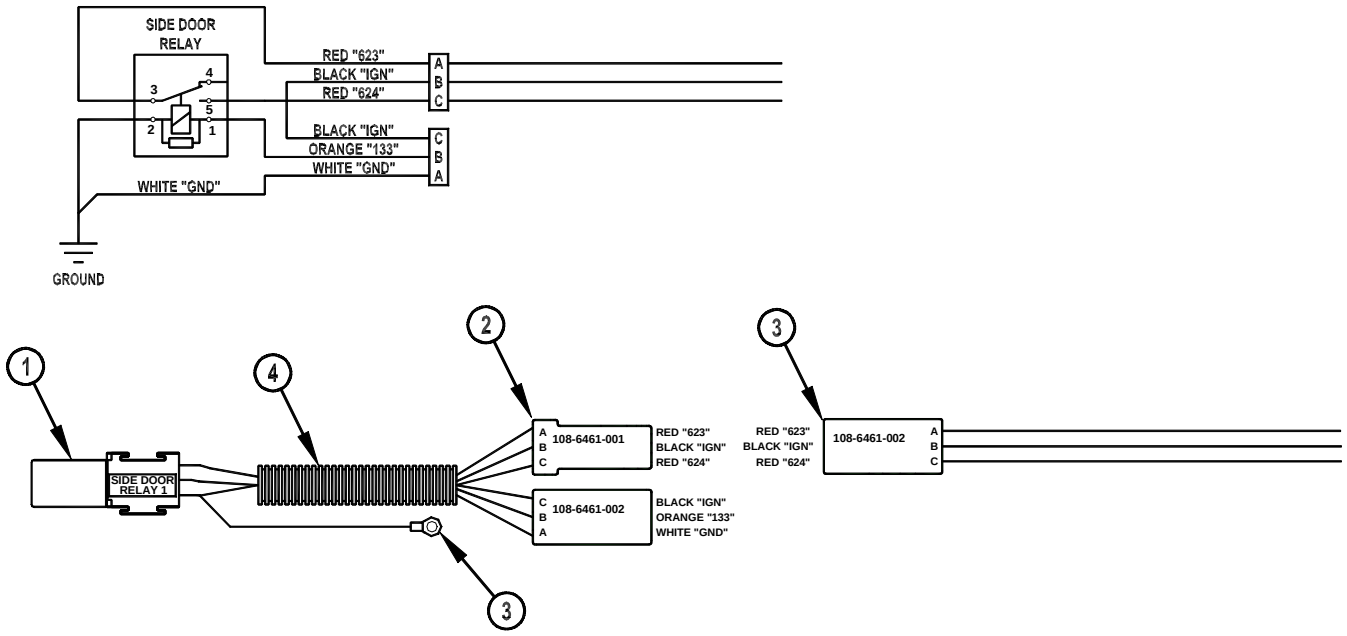
FORMULA 5000

SIDE DOOR PROXIMITY SWITCH KIT
372-0359

REF	PART NO.	DESCRIPTION	REQ'D
1	311-1636	BRACKET, side door latch	1
2	263-0784	HARNESS, wire	1
3	063-0107	SWITCH, proximity – 18mm sourcing	1
4	311-1637	BRACKET, switch	1
5	108-7601	RELAY ASSEMBLY	1
6	036-1122-006	CLAMP	6
7	FS070920	CAPSCREW – 3/8" – 16NC x 1"	6
8	FS230900	NUT, lock – 3/8" – 16NC	6

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SIDE DOOR INTERLOCK RELAY ASSEMBLY
108-7601



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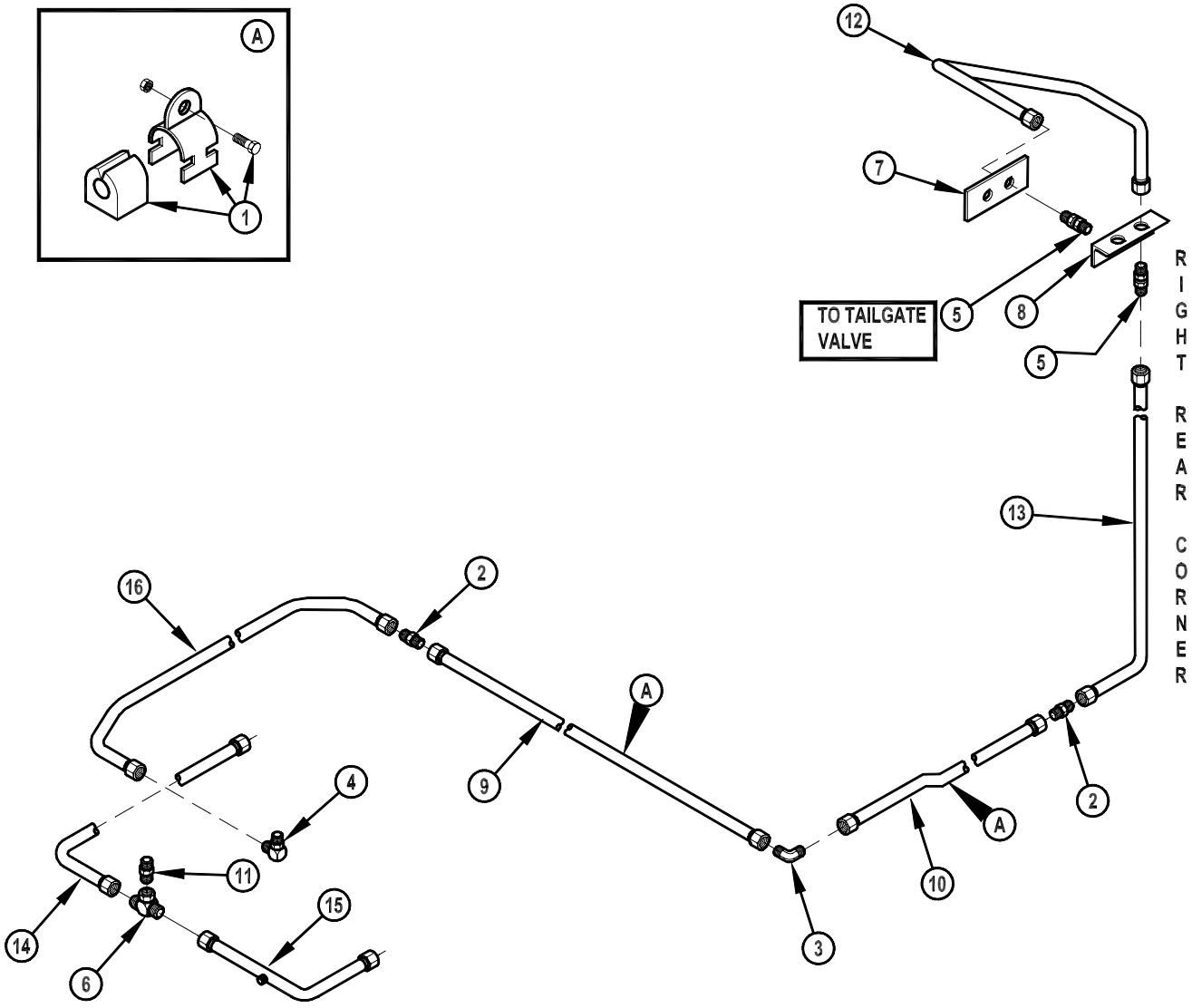
FORMULA 5000

SIDE DOOR INTERLOCK RELAY ASSEMBLY
108-7601

REF	PART NO.	DESCRIPTION	REQ'D
1	069-0032	RELAY, micro	1
2	108-6461-001	CONNECTOR, 3-way plug	1
3	108-6461-002	CONNECTOR, 3-way receptical	2
4	108-4298	LOOM	1FT
5	108-4943-003	TERMINAL, ring - #10	1
6	108-6718-133	WIRE – 18AWG (orange "133")	1FT
7	108-6718-623	WIRE – 18AWG (red "623")	4FT
8	108-6718-624	WIRE – 18AWG (red "624")	4FT
9	108-6718-GND	WIRE – 18AWG (white GND)	2FT
10	108-6718-IGN	WIRE – 18AWG (black "IGN")	4FT

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BODY HYDRAULICS for TAILGATE LOCK OPTION



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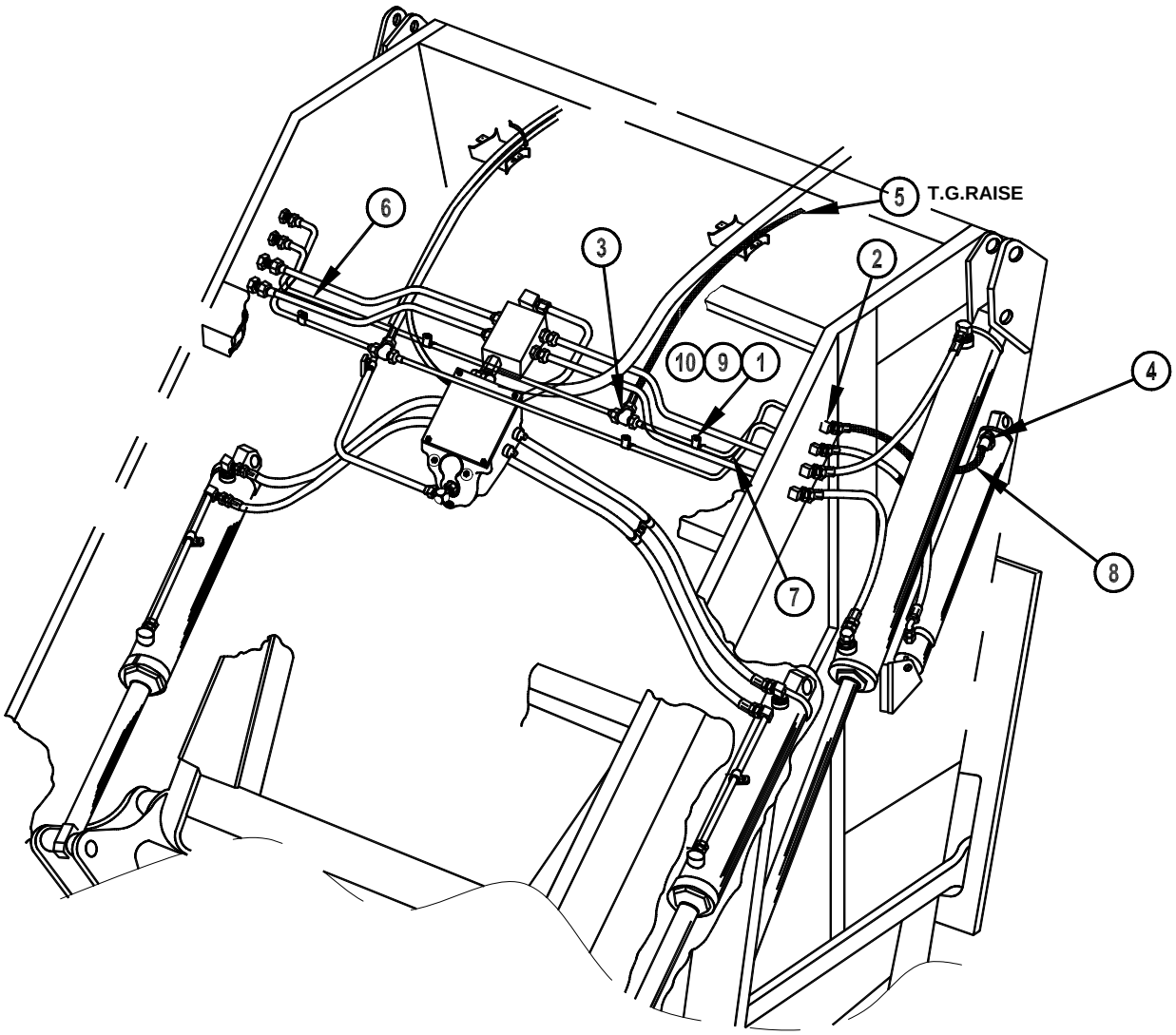
FORMULA 5000

BODY HYDRAULICS for TAILGATE LOCK OPTION

REF	PART NO.	DESCRIPTION	REQ'D
1	036-1474-004	CLAMP, tube – 1/2"	5
2	054-3007-006	CONNECTOR, straight – 1/2"	2
3	054-3185-008	ELBOW, 90° - 1/2"	1
4	054-3237-013	ELBOW, 90° reducing	1
5	054-3535-006	ELBOW, 90° bulkhead	2
6	054-3623-007	TEE – 5/8"	1
7	311-0673	BRACKET, bulkhead	1
8	311-1114	BRACKET, bulkhead	1
9	354-0823-001	TUBE, hydraulic – for 18 yd units	1
	354-0823-002	TUBE, hydraulic – for 20 yd units	1
	354-0823-003	TUBE, hydraulic – for 25 yd units	1
	354-0823-004	TUBE, hydraulic – for 27 yd units	1
	354-0823-005	TUBE, hydraulic – for 32 yd units	1
10	354-0838	TUBE, hydraulic	1
11	354-1216-003	CONNECTOR	1
12	354-1217	TUBE, hydraulic	1
13	354-1218	TUBE, hydraulic – right rear corner	1
14	354-1219	TUBE, hydraulic - valve	1
15	354-1220	TUBE, hydraulic	1
16	354-1294	TUBE, hydraulic	1

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TAILGATE HYDRAULICS for TAILGATE LOCK OPTION



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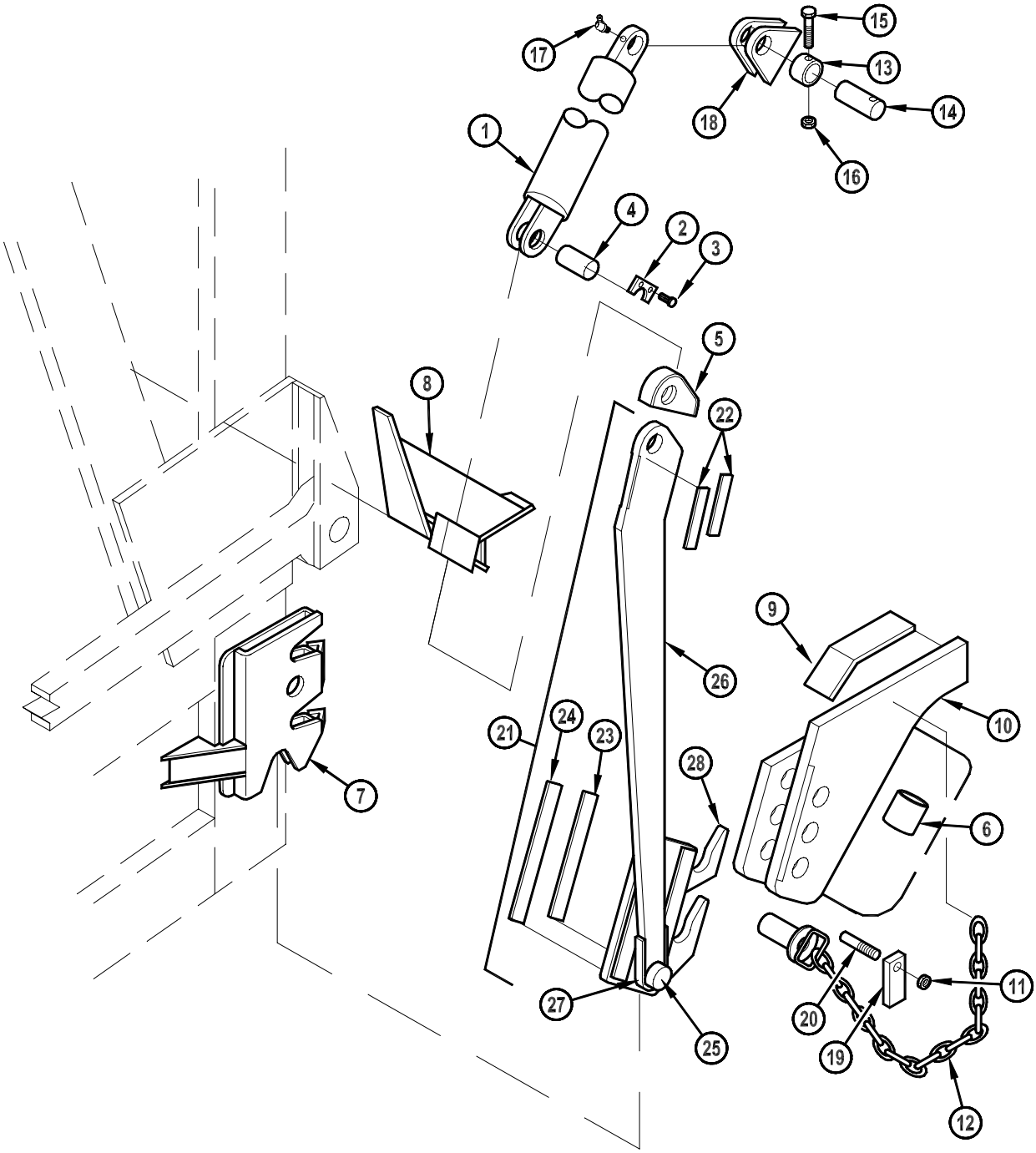
FORMULA 5000

TAILGATE HYDRAULICS for TAILGATE LOCK OPTION

REF	PART NO.	DESCRIPTION	REQ'D
1	036-1122-008	CLAMP, tube	2
2	054-3533-006	ELBOW, 90° bulkhead	2
3	054-3623-006	TEE	1
4	054-7434	ELBOW, 90° - special	2
5	057-1878	HOSE, hydraulic	1
6	354-1295-001	TUBE, hydraulic	1
7	354-1295-002	TUBE, hydraulic	1
8	QC3-FFFF-047	HOSE, hydraulic	2
9	FS100915	CAPSCREW – 3/8" – 24NC x 3/4"	2
10	FS240900	NUT, lock – 3/8" – 24NC	2

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TAILGATE LOCK MECHANISM and PARTS



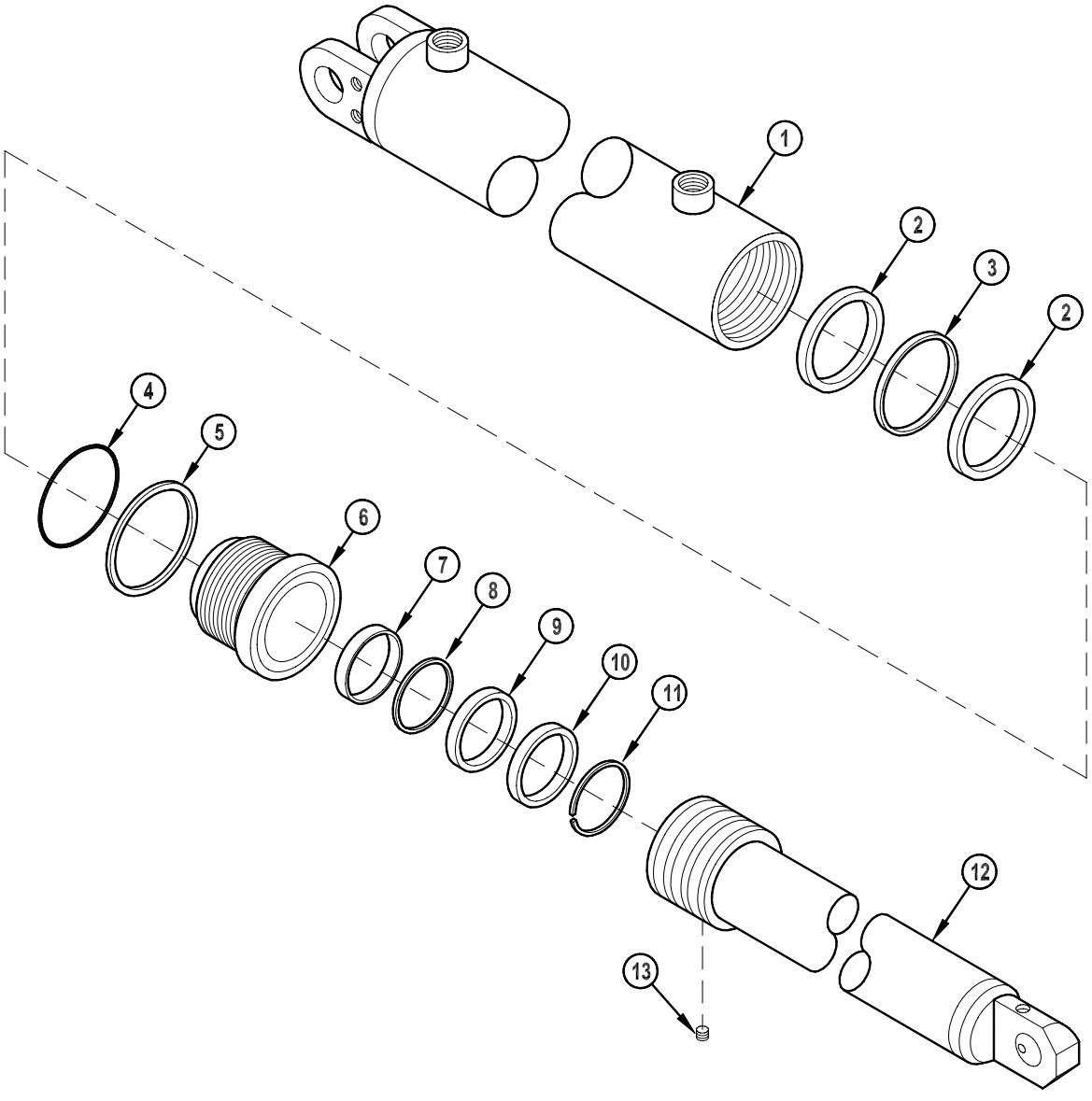
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TAILGATE LOCK MECHANISM and PARTS

REF	PART NO.	DESCRIPTION	REQ'D
1	001-6286.	CYLINDER, tailgate raise (see page 7.25)	2
2	311-0069	RETAINER, cylinder pin	2
3	FS070920	CAPSCREW – 3/8" – 16NC x 1"	2
4	048-6144	PIN, cylinder base end	2
5	113-0474	CAP (weldment)	1
6	311-0116	BRACKET, lock pin	2
7	311-0919	BRACKET, lower tailgate lock – left hand	1
	311-0920	BRACKET, lower tailgate lock – right hand	1
8	311-0070	BRACKET – left hand	1
	311-0071	BRACKET – right hand	1
9	234-1637	PLATE, body hook – inside	2
10	234-1636	PLATE, body hook – outside	2
11	047-2285-001	NUT, acorn	2
12	048-6162	PIN ASSEMBLY with chain	2
13	040-2205	RETAINER (part of item 24)	2
14	048-5475-038	PIN, cylinder rod end	2
15	FS100932	CAPSCREW – 3/8' – 24NF x 2-1/4"	2
16	FS240900	NUT, lock – 3/8" – 24NF	4
17	230-0001-006	FITTING, grease – 1/8" NPT x 45°	2
18	211-2064	HINGE, cylinder (weldment)	2
19	021-3874	BAR, lock	2
20	047-2392	STUD	2
21	004-2522	LOCK HOOK – weldment – left hand	1
	004-2523	LOCK HOOK – weldment – right hand	1
22	004-1965-001	BAR, wear, top	2
23	004-1965-002	BAR, wear, bottom – short	2
24	004-1965-003	BAR, wear, bottom – long	2
25	004-1965-004	ROD	1
26	004-2521	LINK, lock	1
27	004-1965-006	BRACE	1
28	234-0494	PLATE, lower hook	1

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TAILGATE RAISE CYLINDER
001-6286



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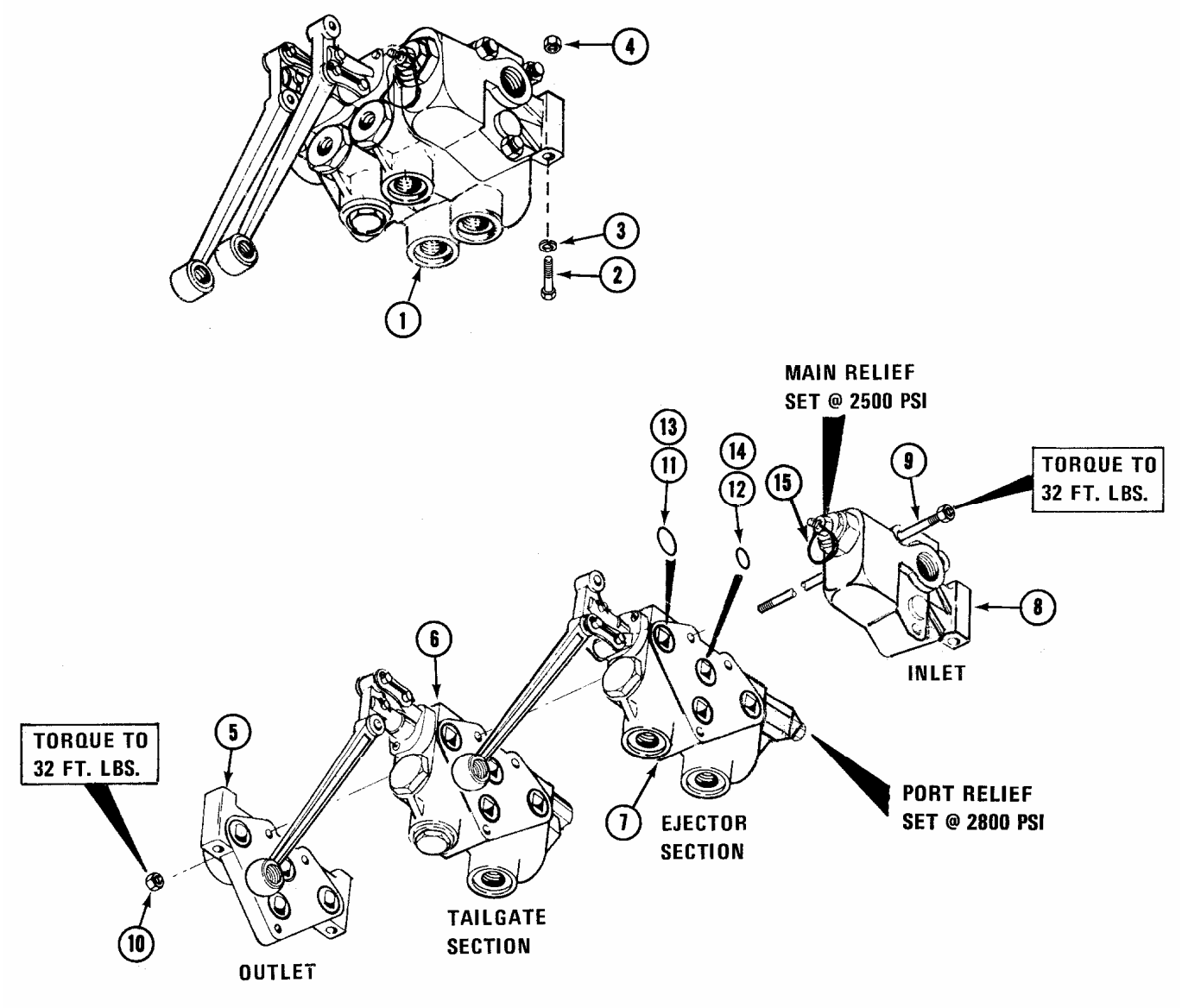
FORMULA 5000

TAILGATE RAISE CYLINDER
001-6286

REF	PART NO.	DESCRIPTION	REQ'D
1	001-6286-001	BARREL ASEMBLY	1
2	NSS	RING, wear	2
3	NSS	SEAL, piston	1
4	NSS	O-RING	1
5	NSS	RING, back-up	1
6	001-6286-003	GLAND	1
7	NSS	RING, wear	1
8	NSS	RING, buffer	1
9	NSS	SEAL, u-cup rod	1
10	NSS	WIPER, canned	1
11	001-5098-008	RING, retaining	1
12	001-6286-002	ROD ASSEMBLY	1
13	FS440707	SETSCREW – 1/4" x 1/4"	1
-	272-4922	SEAL KIT (consists of items 2 thru 5 & 7 thru 10)	1

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UNDERBODY CONTROL VALVE for EJECTOR and TAILGATE FUNCTIONS
USED WITH TAILGATE LOCK OPTION
031-5971



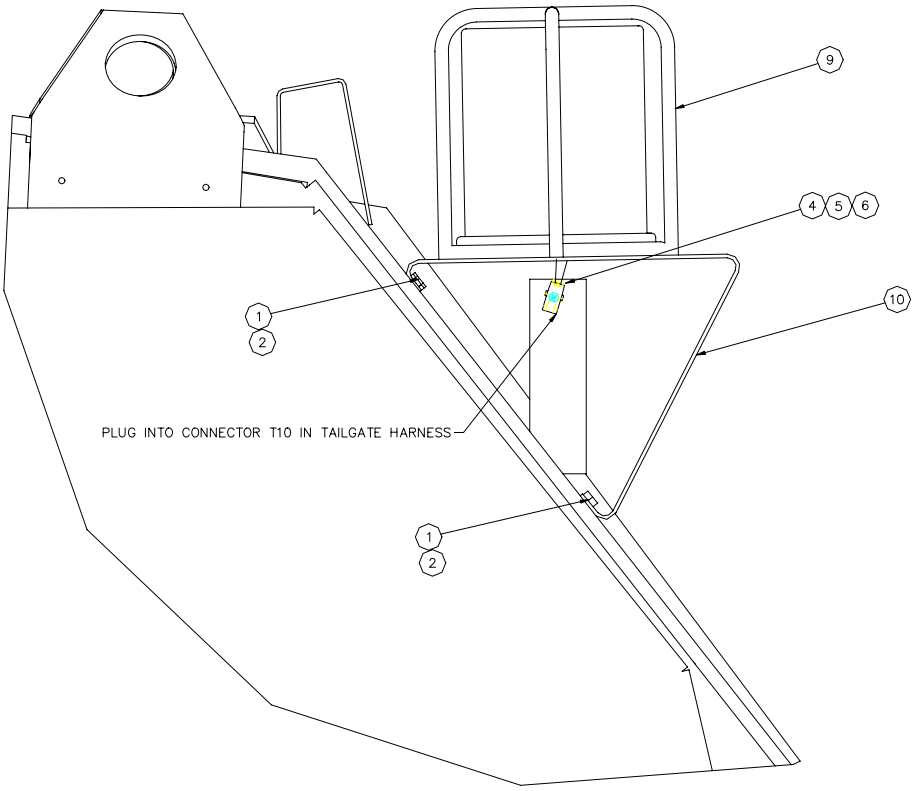
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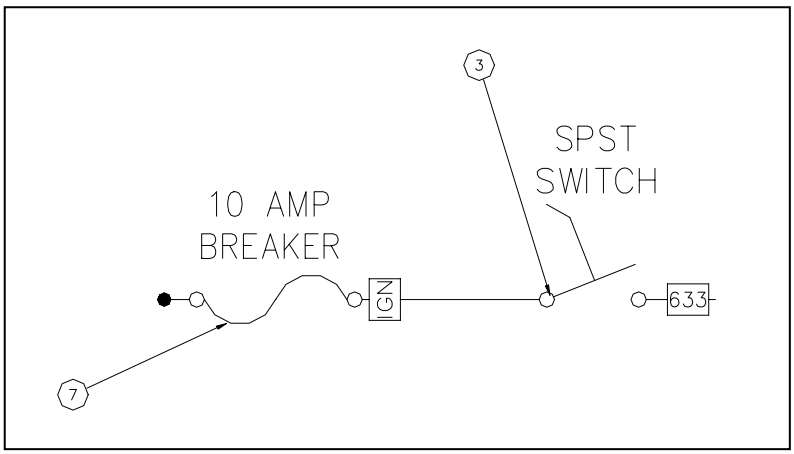
UNDERBODY CONTROL VALVE for EJECTOR and TAILGATE FUNCTIONS USED WITH TAILGATE LOCK OPTION 031-5971

REF	PART NO.	DESCRIPTION	REQ'D
1	031-5971	VALVE, control	1
2	FS070840	CAPSCREW – 5/16" – 18NC x 3"	3
3	FS550800	WASHER, lock – 5/16"	3
4	FS230800	NUT, lock – 5/16" – 18NC	3
5	REF.	OUTLET SECTION	1
6	REF.	SECTION, tailgate	1
7	REF.	SECTION,	1
8	REF.	INLET	1
9	031-3285-051	SCREW – 3/8" – 16 x 6"	3
10	031-3285-052	NUT, hex – 3/8" – 16	3
11	031-3285-046	SEAL, o-ring - .926 I.D. (2/section)	6
12	031-3285-047	SEAL, o-ring - .801 I.D. (2/section)	6
13	031-3285-071	SEAL, o-ring - .914 I.D (2/section)	6
14	031-3285-070	SEAL, o-ring - .799 I.D. (2/section)	6
15	022-3008	WIRE LOCK	1
-	031-3285-048	SEAL KIT (consists of items 11, 12, 13,14 (2 each)	1
-	031-3285-006	STUD KIT (consists of items 9 & 10)	1

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TAILGATE STROBE KIT
272-3288 - AMBER
272-3288-100 - CLEAR





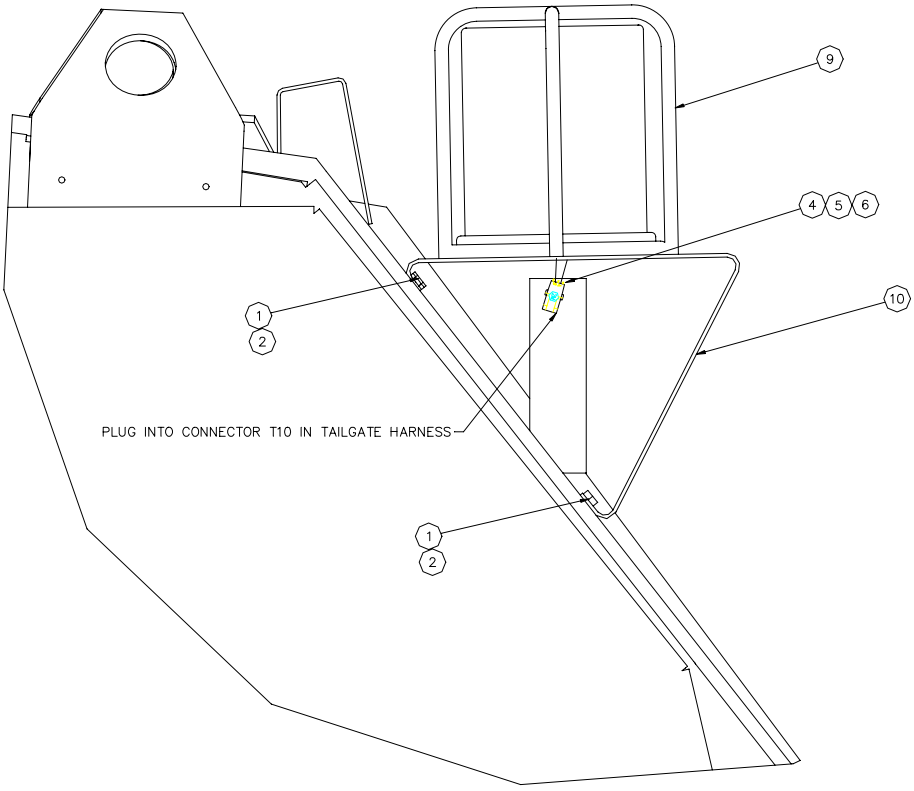
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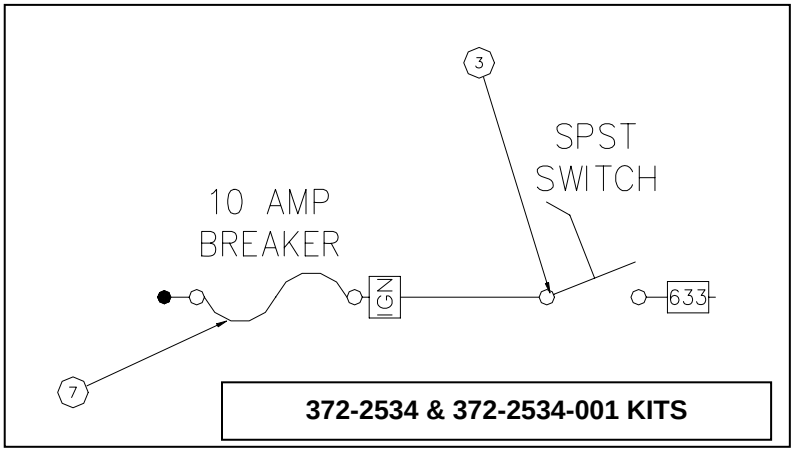
TAILGATE STROBE KIT
272-3288 - AMBER
272-3288-100 - CLEAR

REF	PART NO.	DESCRIPTION	REQ'D
1	047-2187	CAPSCREW – 1/4" – 20NC x 3/4"	4
2	047-2188	NUT, lock – 1/4" – 20nc	4
3	108-1814	SWITCH, toggle	1
4	108-4827-003	CONNECTOR, 2-way male	1
5	108-4827-111	TERMINAL, male – 14-16 AWG	2
6	108-4827-132	SEAL, cable	2
7	108-4867-005	BREAKER, circuit – 10 AMP	1
8	108-7114-010	FITTING, female	1
9	115-1232	LIGHT, strobe – amber (272-3288 kit)	1
	115-1232-001	LIGHT	1
	115-1278	LIGHT, strobe – clear – (272-3288-100 kit0	1
	115-1278-001	LIGHT	1
10	311-3095	BRACKET	1

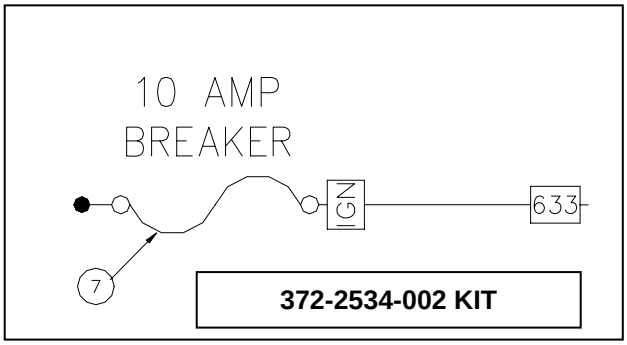
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TAILGATE STROBE KIT – (DUAL)
372-2534 – CLEAR
372-2534-001 – AMBER (SWITCH IN CAB)
372-2534-002 – AMBER (IGN. POWER)





372-2534 & 372-2534-001 KITS



372-2534-002 KIT

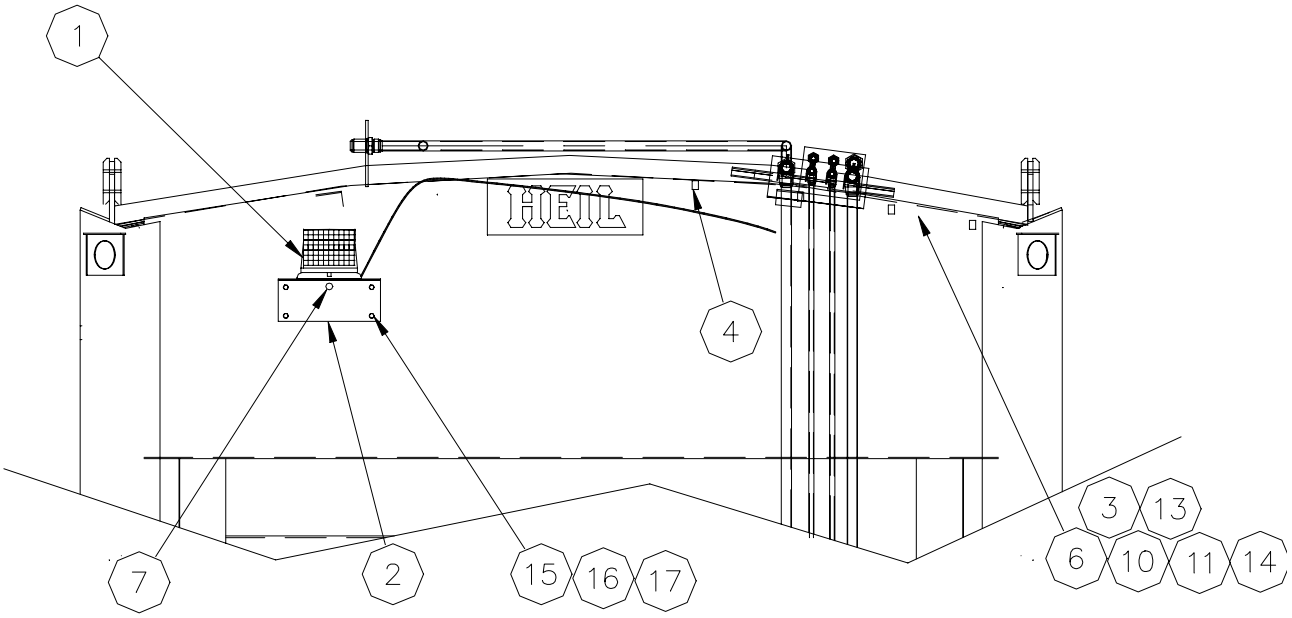
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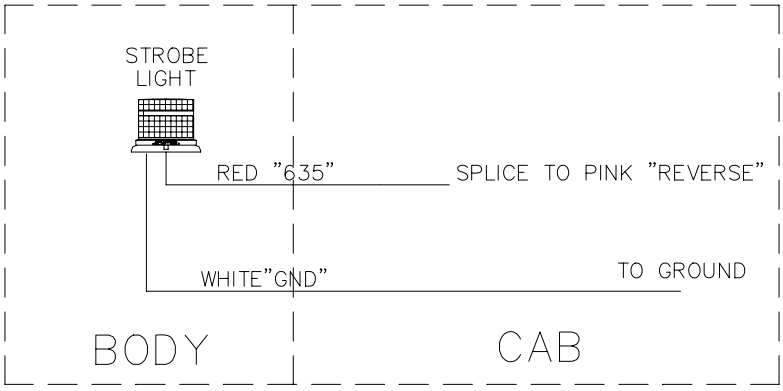
TAILGATE STROBE KIT – (DUAL)
372-2534 – CLEAR
372-2534-001 – AMBER (SWITCH IN CAB)
372-2534-002 – AMBER (IGN. POWER)

REF	PART NO.	DESCRIPTION	REQ'D
1	047-2187	CAPSCREW – 1/4" – 20NC x 3/4"	4
2	047-2188	NUT, lock – 1/4" – 20nc	4
3	108-1814	SWITCH, toggle (372-2534 & 372-2534-001 kits)	1
4	108-4827-003	CONNECTOR, 2-way male	1
5	108-4827-111	TERMINAL, male – 14-16 AWG	2
6	108-4827-132	SEAL, cable	2
7	108-4867-005	BREAKER, circuit – 10 AMP	1
8	108-7114-010	FITTING, female	1
9	115-0871	LIGHT, strobe - amber - (372-2534-001 & -002 kits)	1
	115-0871-001	LIGHT	1
	115-1278	LIGHT, strobe – clear – (372-2534 kit)	1
	115-1278-001	LIGHT	1
10	311-3095	BRACKET	1
11	113-3137-001	COVER	1
12	207-8891-001	COVER	1

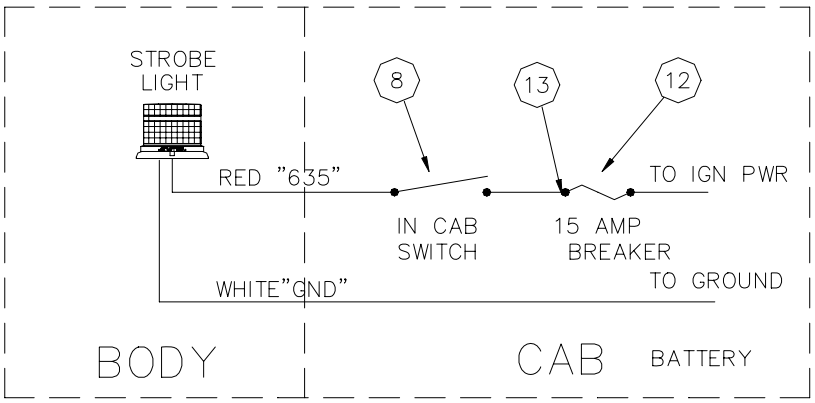
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ROTATING BEACON LIGHT KIT (FRONT OF BODY)
108-6417-003 – SWITCH IN CAB
108-6417-004 – SWITCHED IN REVERSE





108-6417-004



108-6417-003

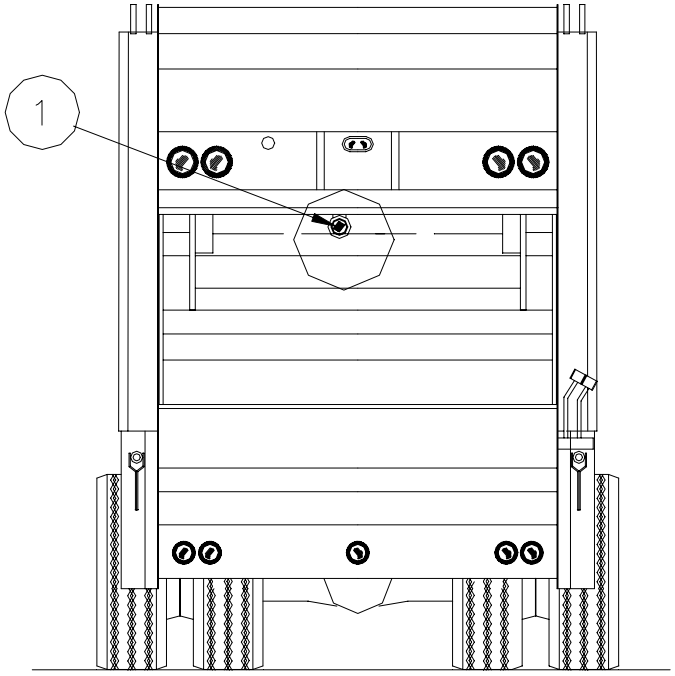
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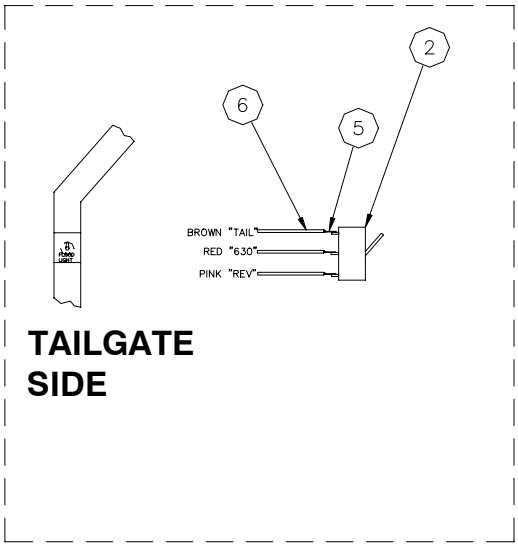
ROTATING BEACON LIGHT KIT (FRONT OF BODY)
108-6417-003 – SWITCH IN CAB
108-6417-004 – SWITCHED IN REVERSE

REF	PART NO.	DESCRIPTION	REQ'D
1	115-0868	LIGHT, rotating beacon	1
2	211-4344	BRACKET	1
3	036-115	TIE, cable	3
4	036-1249	CLAMP, tube	3
5	054-7350-002	SHRINK, tube	3
6	108-6716-635	WIRE – 14GA – red "635"	4 ft
7	108-052	GROMMET	1
8	108-1814	SWITCH, toggle	1
9	108-4430	CONNECTOR, butt	2
10	108-4470	LOOM – 3/8"	4 ft
11	108-6716-GND	WIRE – white "GND"	4 ft
12	108-4867-001	BREAKER, circuit – 15 AMP	1
13	108-7114-010	CONNECTOR, female	2
14	108-6461-012	PLLUG, 2-way	1
15	047-2187	CAPSCREW – 1/4" – 20NC x 3/4"	4
16	047-2188	NUT, lock – 1/4" – 20NC	4
17	FS510750	WASHER, flat – 1/4"	4

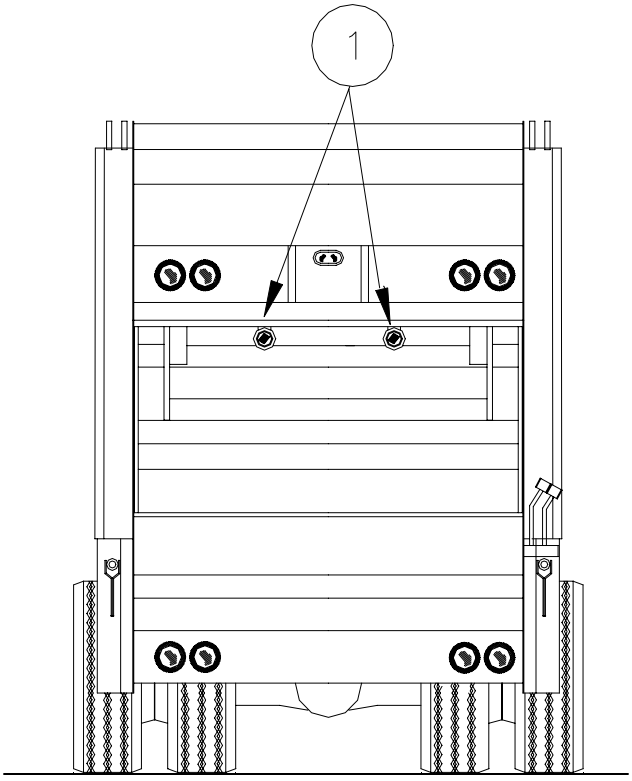
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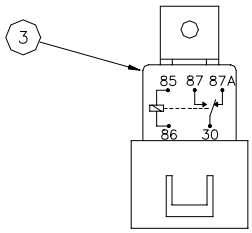
HOPPER FLOOD LIGHT KIT – (SWITCH ON SIDE OF TAILGATE)
372-1572-001 - SINGLE
372-1572-002 - DUAL





TAILGATE SIDE



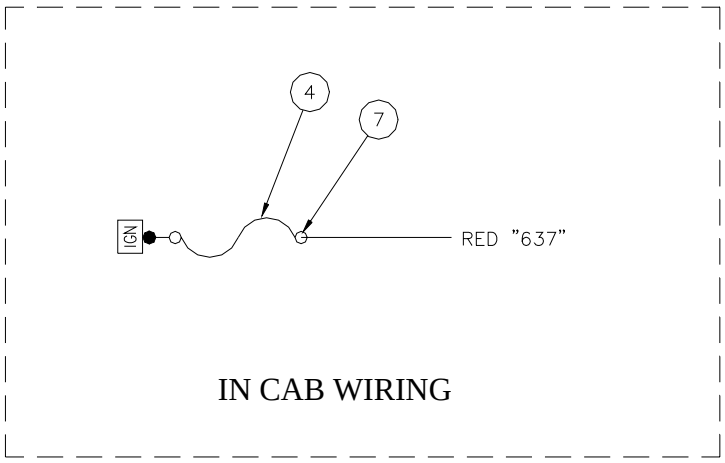


UPPER TAIL LIGHT CROSSMEMBER

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HOPPER FLOOD LIGHT KIT – (SWITCH ON SIDE OF TAILGATE)
372-1572-001 - SINGLE
372-1572-002 - DUAL

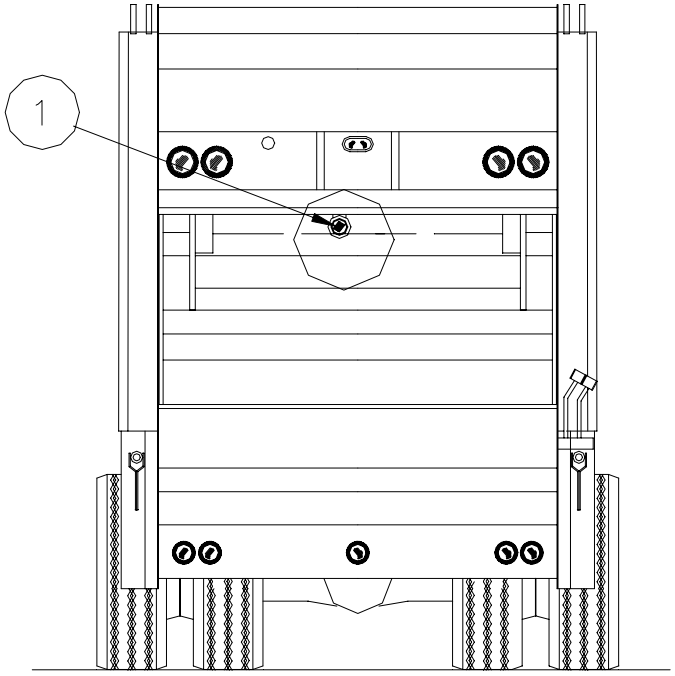
REF	PART NO.	DESCRIPTION	REQ'D
1	115-1226	LIGHT, flood	A/R
	115-1225	LIGHT	1
	108-6461-012	RECEPTICLE, 2-pin	1
	108-7336-002	LOOM	1 ft
2	108-2282	SWITCH, toggle	1
3	108-6752-001	RELAY	1
4	108-4867-005	BREAKER, circuit – 10 AMP	1
5	108-4943-003	TERMINAL, ring - #10	3
6	054-7350	TUBE, shrink	1 ft
7	108-7114-010	TERMINAL, female	2



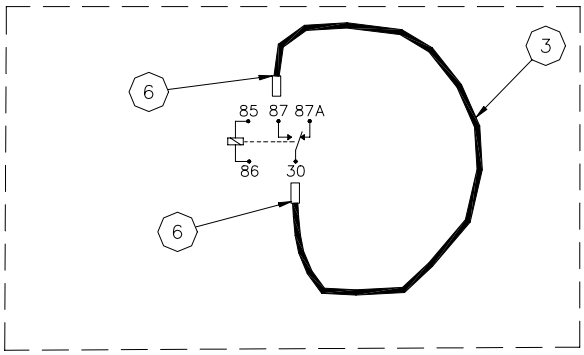
IN CAB WIRING

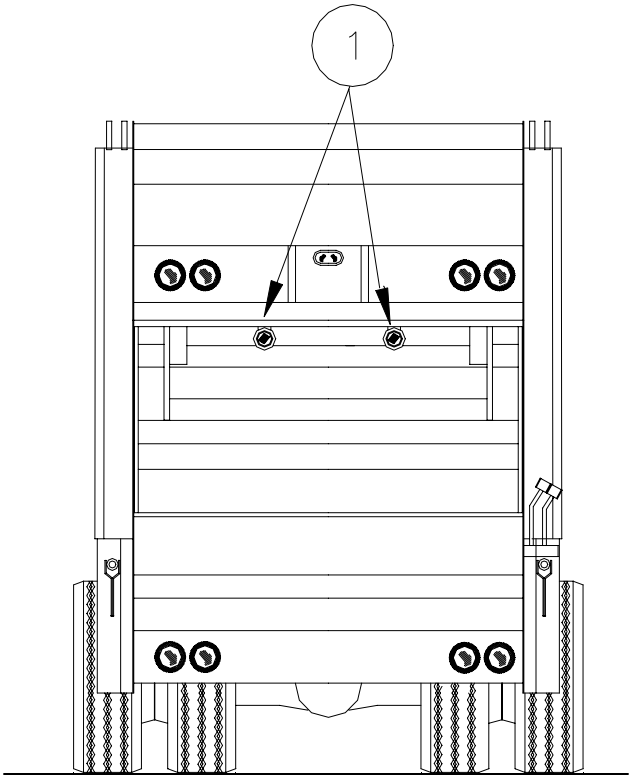
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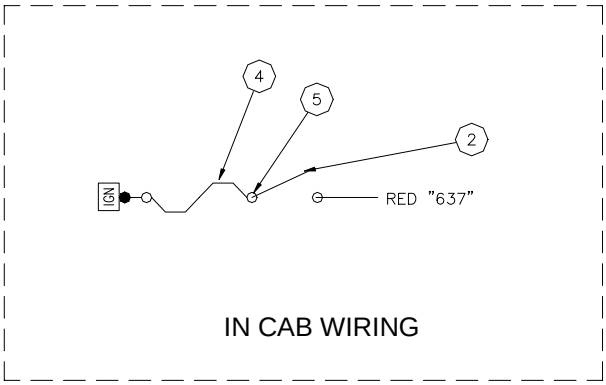
HOPPER FLOOD LIGHT KIT – (SWITCH IN CAB)
372-1842-001 - SINGLE
372-1842-002 - DUAL



UPPER TAIL LIGHT
CROSSMEMBER







IN CAB WIRING

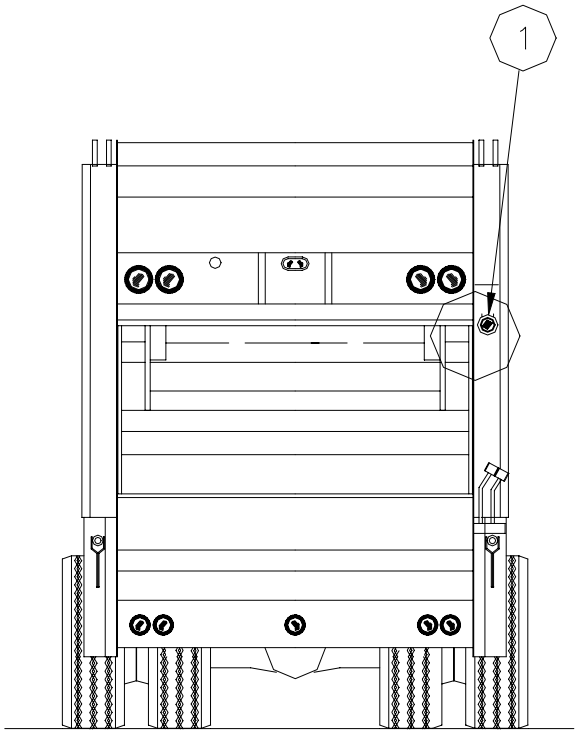
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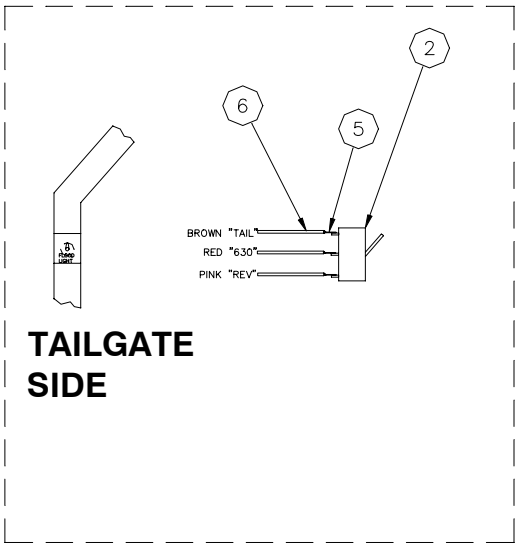
HOPPER FLOOD LIGHT KIT – (SWITCH IN CAB)
372-1842-001 - SINGLE
372-1842-002 - DUAL

REF	PART NO.	DESCRIPTION	REQ'D
1	115-1226	LIGHT, flood	A/R
	115-1225	LIGHT	1
	108-6461-012	RECEPTICLE, 2-pin	1
	108-7336-002	LOOM	1 ft
2	108-1814	SWITCH, toggle	1
3	108-2750-006	WIRE – 12 GA - white	6 inches
4	108-4867-005	BREAKER, circuit – 10 AMP	1
5	108-7114-010	TERMINAL, female	2
6	108-7149-006	CONNECTOR	2

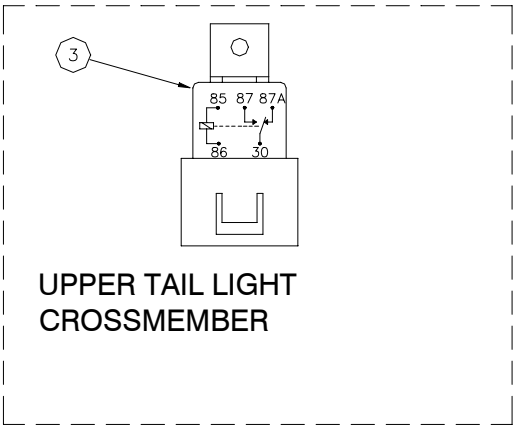
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HOPPER FLOOD LIGHT KIT – (LIGHT/SWITCH ON RH SIDE OF TAILGATE)
372-2236





TAILGATE SIDE

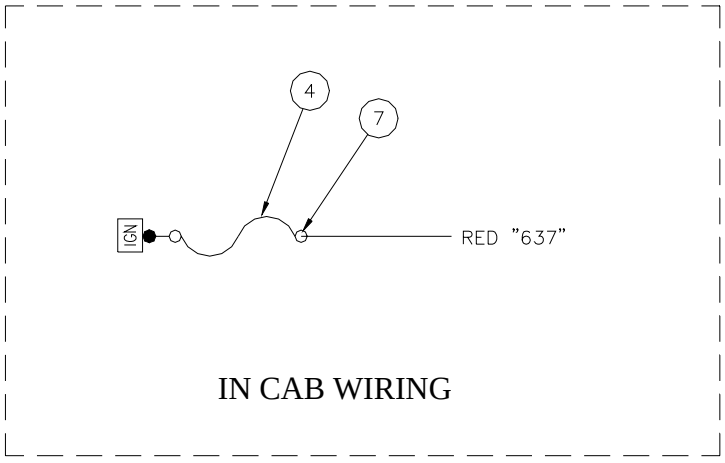


UPPER TAIL LIGHT CROSSMEMBER

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HOPPER FLOOD LIGHT KIT – (LIGHT/SWITCH ON RH SIDE OF TAILGATE) 372-2236

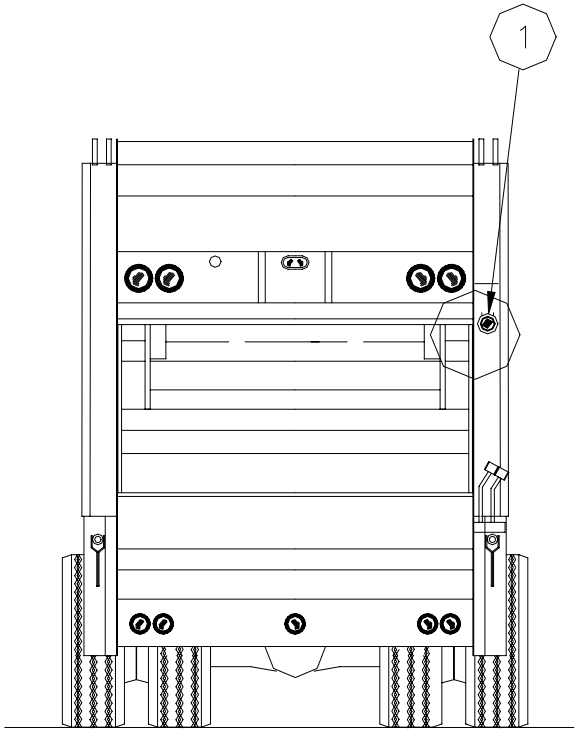
REF	PART NO.	DESCRIPTION	REQ'D
1	115-1226	LIGHT, flood	A/R
	115-1225	LIGHT	1
	108-6461-012	RECEPTICLE, 2-pin	1
	108-7336-002	LOOM	1 ft
2	108-2282	SWITCH, toggle	1
3	108-6752-001	RELAY	1
4	108-4867-005	BREAKER, circuit – 10 AMP	1
5	108-4943-003	TERMINAL, ring - #10	3
6	054-7350	TUBE, shrink	1 ft
7	108-7114-010	TERMINAL, female	2

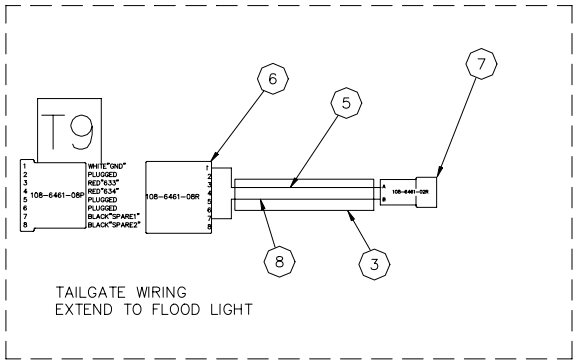


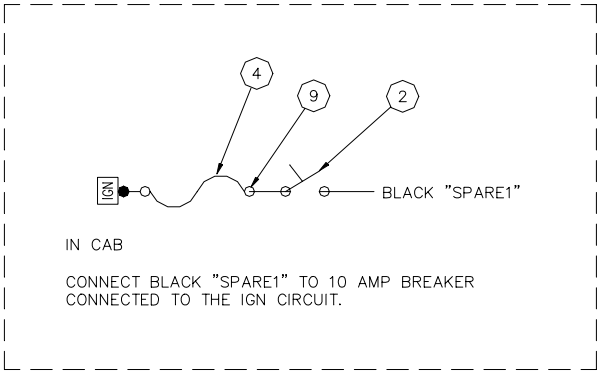
IN CAB WIRING

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HOPPER FLOOD LIGHT KIT – (LIGHT ON RH SIDE OF TAILGATE – SWITCH IN CAB)
372-2236-001



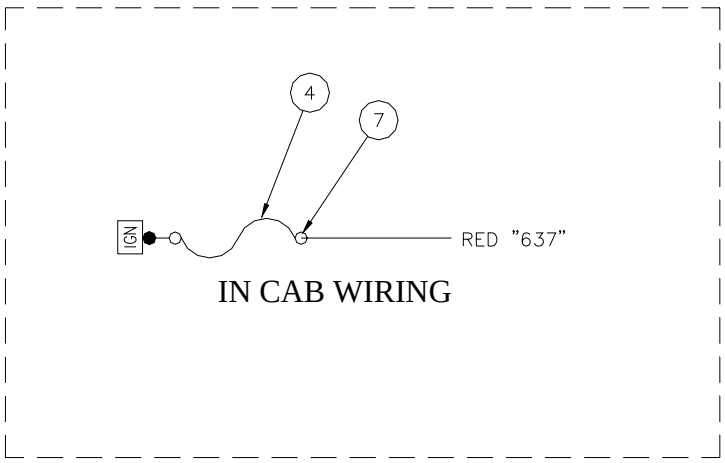




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HOPPER FLOOD LIGHT KIT – (LIGHT ON RH SIDE OF TAILGATE – SWITCH IN CAB) 372-2236-001

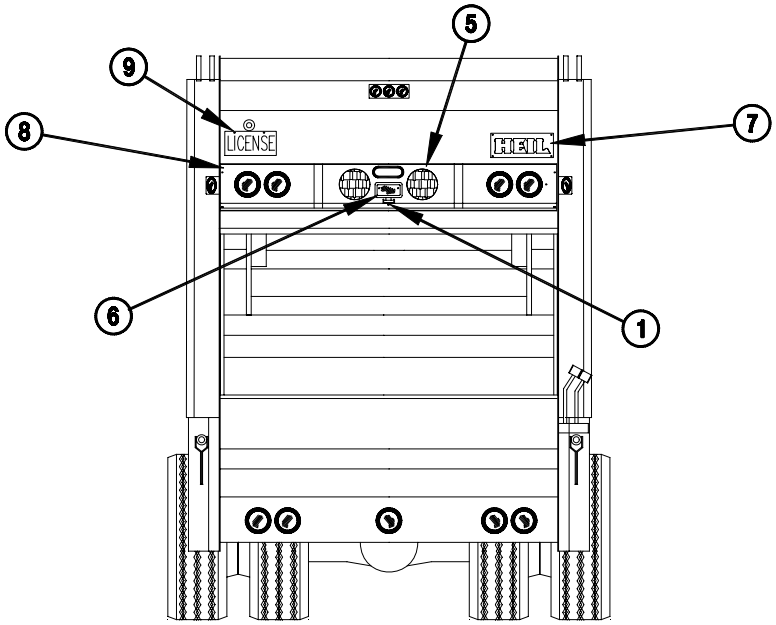
REF	PART NO.	DESCRIPTION	REQ'D
1	054-7350	TUBE, shrink	1 ft
2	108-1814	SWITCH, toggle	1
3	108-4470	LOOM – 3/8"	68 inches
4	108-4867-005	BREAKER, circuit – 10 AMP	1
5	108-6416-GND	WIRE – white "GND"	6 ft
6	108-6461-008	RECEPTICLE – 8-way	1
7	108-6461-012	RECEPTICLE – 2-way	1
8	108-6716-SP1	WIRE – black "spare1"	6 ft
9	108-7114-010	TERMINAL, female	2
10	115-1226	LIGHT, flood	1
	115-1225	LIGHT	1
	108-6461-012	RECEPTICLE, 2-pin	1
	108-7336-002	LOOM	1 ft

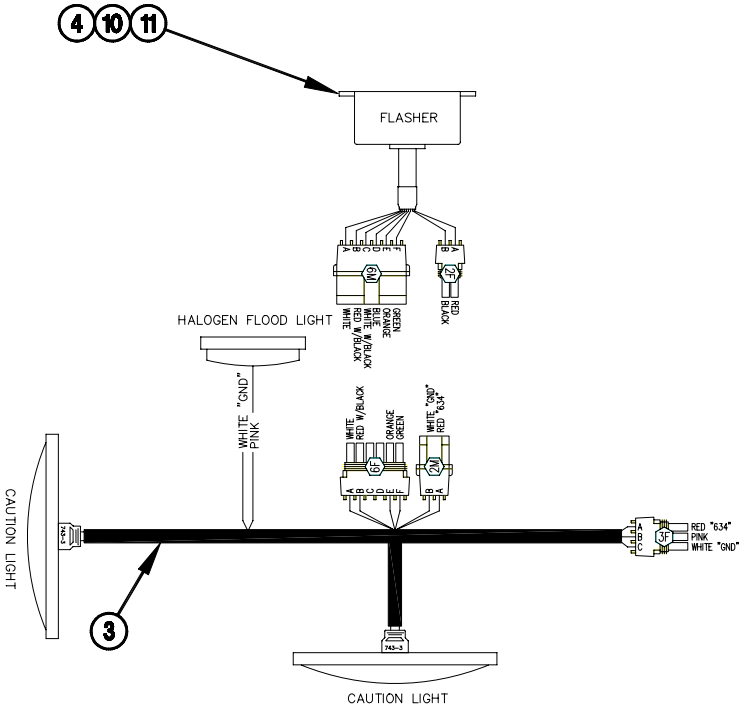


IN CAB WIRING

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MUNICIPAL LIGHT KIT
272-9165-001 - AMBER LIGHTS
272-9165-002 - RED LIGHTS





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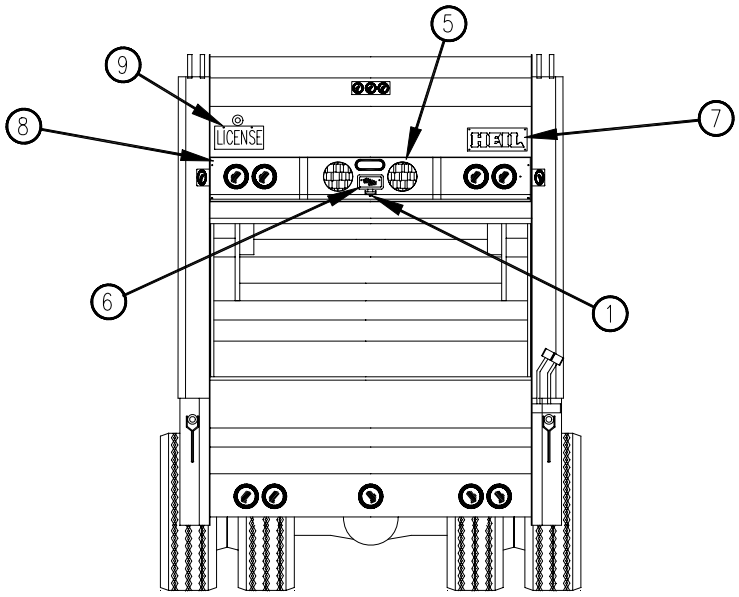
FORMULA 5000

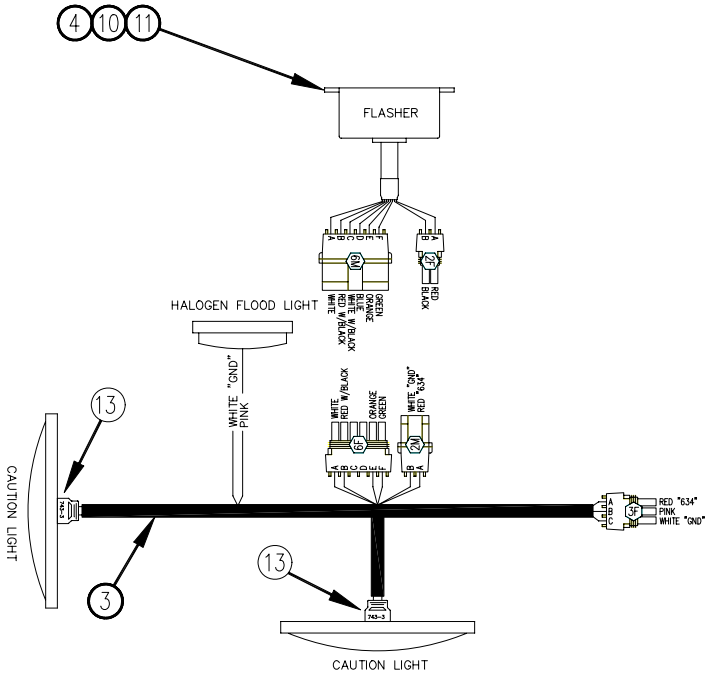
MUNICIPAL LIGHT KIT
272-9165-001 - AMBER LIGHTS
272-9165-002 - RED LIGHTS

REF	PART NO.	DESCRIPTION	REQ'D
1	003-3379	GROMMET, rubber	1
2	108-1814	SWITCH, toggle (located in cab)	1
3	263-0415	HARNESS, wire	1
4	372-0120	FLASHER	1
5	115-1029	LIGHT, 7" amber – (for Kit 272-9165-01)	2
	115-1029-001	LIGHT	1
	115-0742-001	PIGTAIL	1
	115-0912	LIGHT, 7" red – (for Kit 272-9165-02)	2
	115-0742-003	PIGTAIL	1
6	115-1224	LIGHT, flood	1
7	211-7167	BRACKET, logo	1
8	211-4801	BRACKET, light	1
9	211-4901	PLATE, license	1
10	FSP420415	SCREW, machine - #10 – 32 x 3/4"	2
11	FSP270400	NUT, hex - #10 – 32	2
12	108-4867-005	BREAKER, circuit – 10 Amp (in cab - Not shown)	1
13	108-4943	RING, connector - #10 (in cab - not shown)	2

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MUNICIPAL LIGHT KIT - LED
372-2812-001 - AMBER LIGHTS
372-2812-002 - RED LIGHTS





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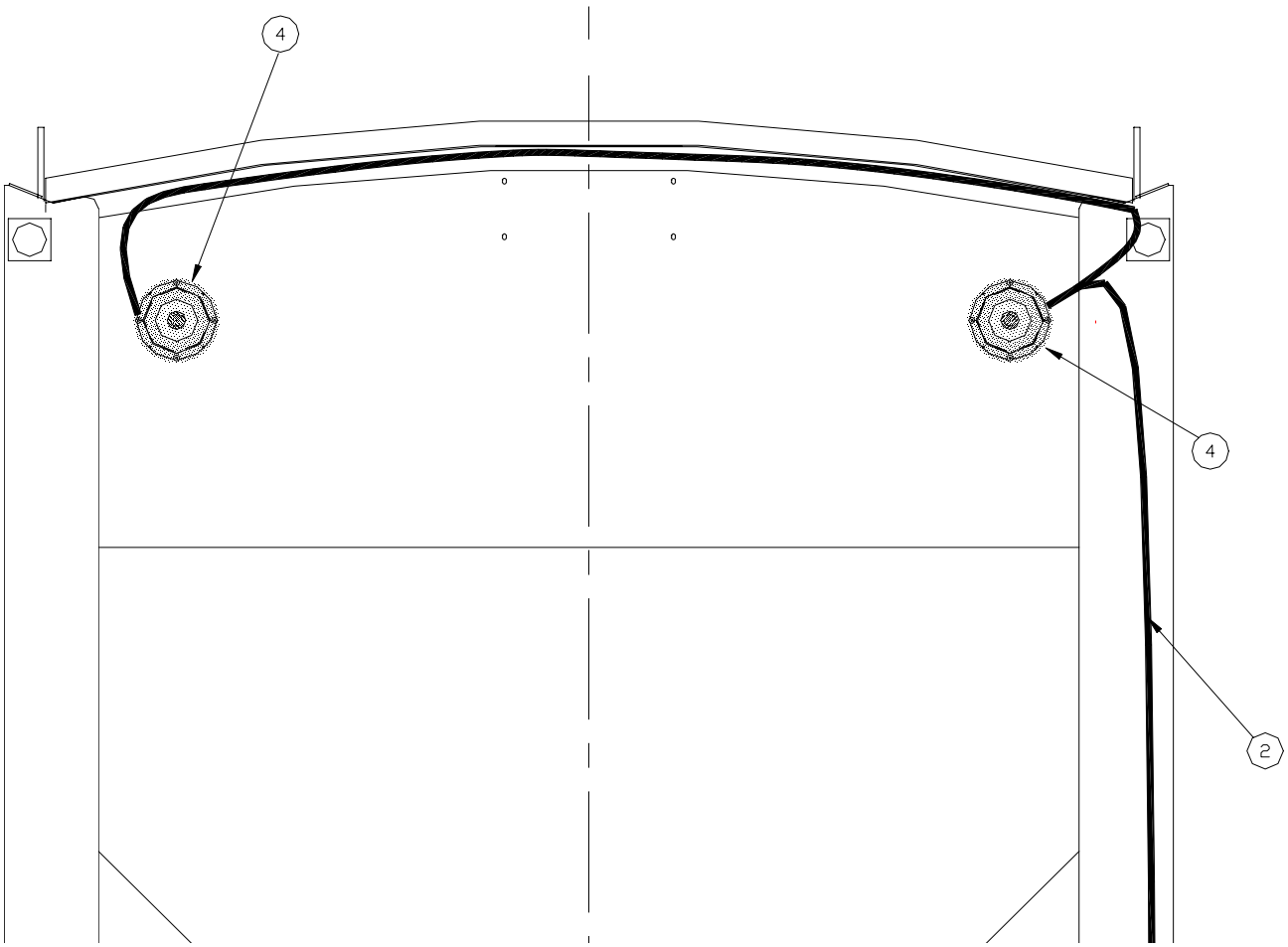
FORMULA 5000

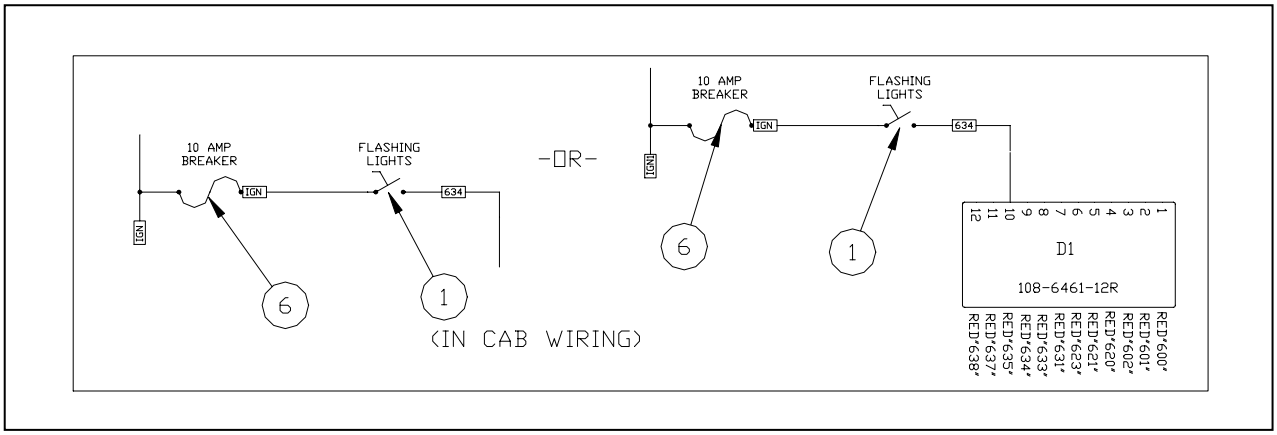
MUNICIPAL LIGHT KIT - LED
372-2812-001 - AMBER LIGHTS
372-2812-002 - RED LIGHTS

REF	PART NO.	DESCRIPTION	REQ'D
1	003-3379	GROMMET, rubber	1
2	108-1814	SWITCH, toggle (located in cab)	1
3	263-0415	HARNESS, wire	1
4	372-0120	FLASHER	1
5	115-1029	LIGHT, 7" amber – (for Kit 272-9165-01)	2
	115-1029-001	LIGHT	1
	115-0742-001	PIGTAIL	1
	115-0912	LIGHT, 7" red – (for Kit 272-9165-02)	2
	115-0742-003	PIGTAIL	1
6	115-1224	LIGHT, flood	1
7	211-7167	BRACKET, logo	1
8	211-4801	BRACKET, light	1
9	211-4901	PLATE, license	1
10	FSP420415	SCREW, machine - #10 – 32 x 3/4"	2
11	FSP270400	NUT, hex - #10 – 32	2
12	108-8051	ADAPTER – 7" LED – amber	2
	108-8052	ADAPTER – 7" –LED – red	2
13	108-4867-005	BREAKER, circuit – 10 Amp (in cab - Not shown)	1
14	108-4943	RING, connector - #10 (in cab - not shown)	2

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AMBER FLASHING LIGHT KIT
272-9363





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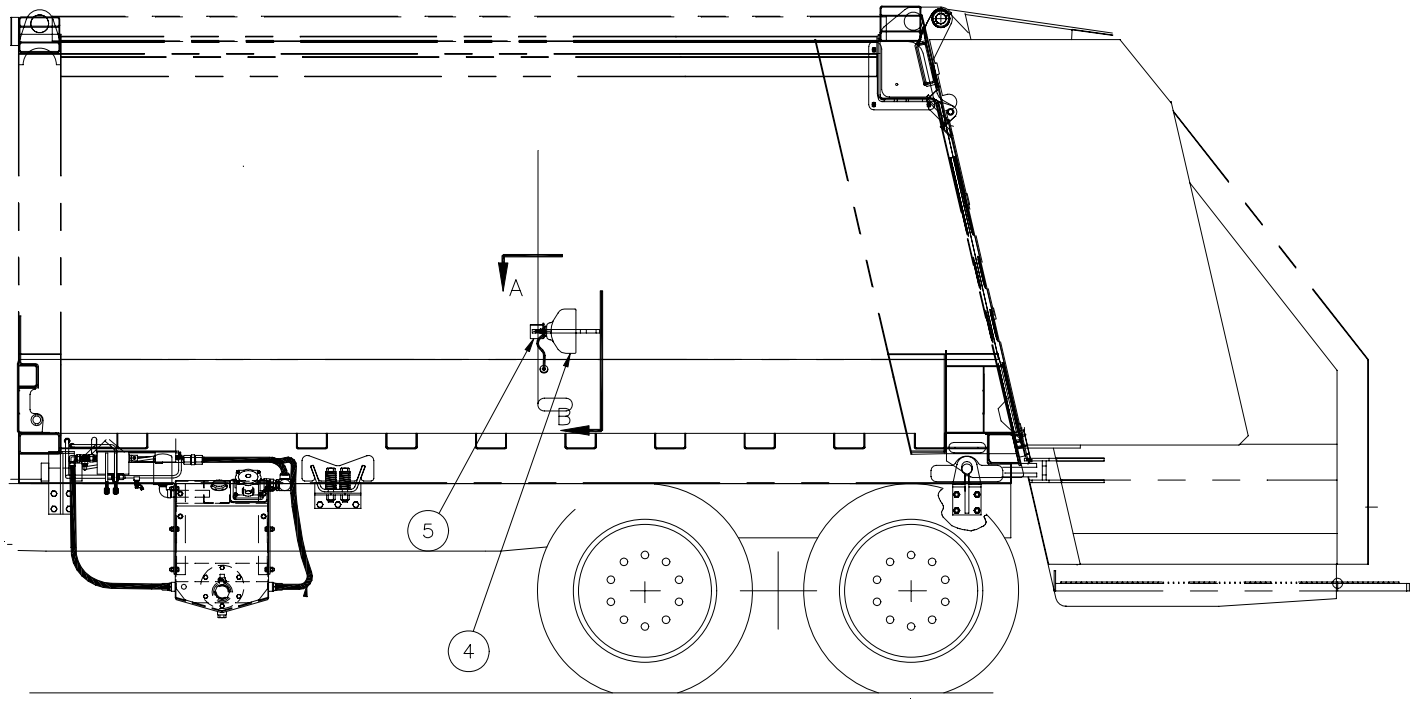
FORMULA 5000

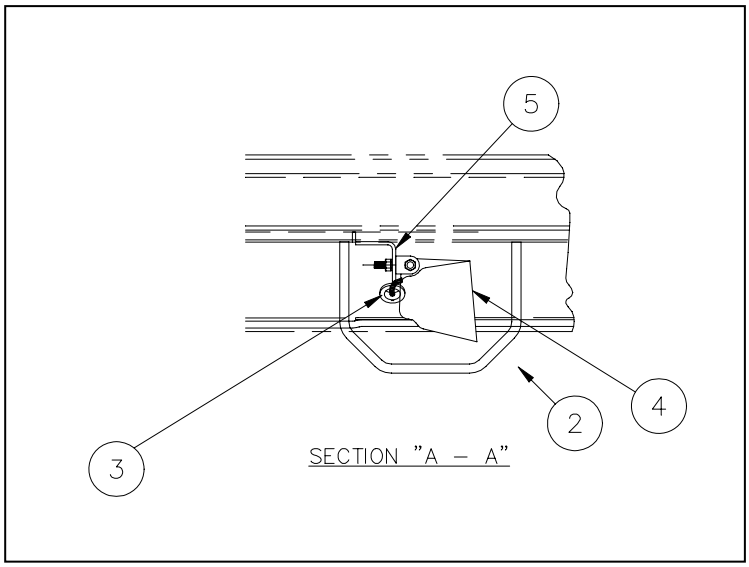
AMBER FLASHING LIGHT KIT
272-9363

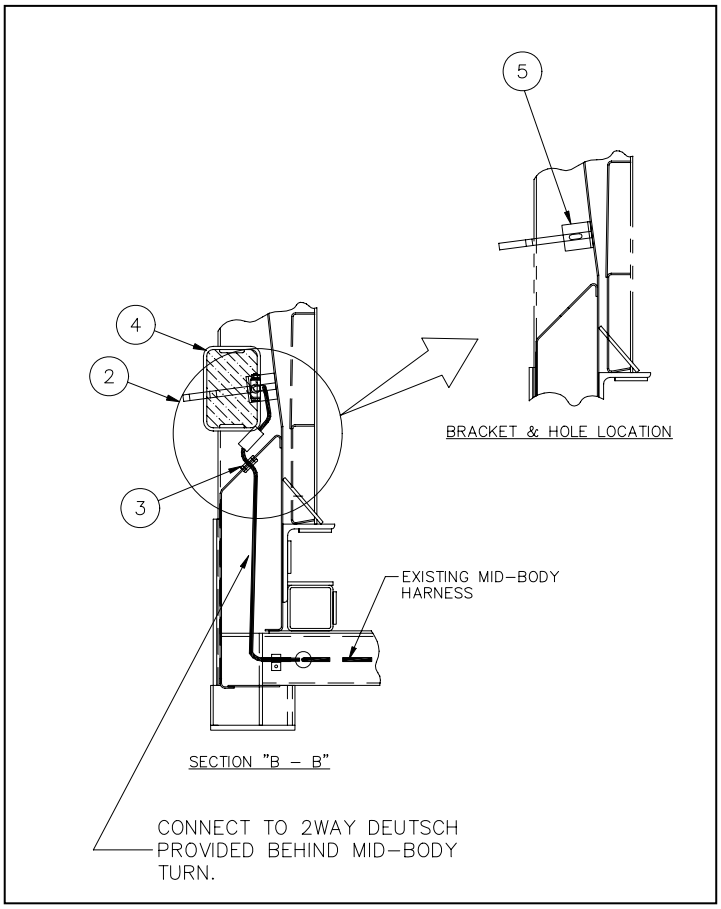
REF	PART NO.	DESCRIPTION	REQ'D
1	108-1814	SWITCH, toggle (not shown – located in cab)	1
2	108-7154	HARNESS, wire	1
3	115-0924	FLASHER	1
4	115-1029	LIGHT, caution – amber	2
	115-1029-001	LAMP – AMBER	1
	115-0742-003	PIGTAIL	1
6	108-4867-005	BREAKER, circuit – 10 Amp	1

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SIDE MOUNTED TRAPEZODIAL LIGHT KIT
372-2100-001 – (SWITCH IN CAB)
372-2100-002 – (ON IN REVERSE)



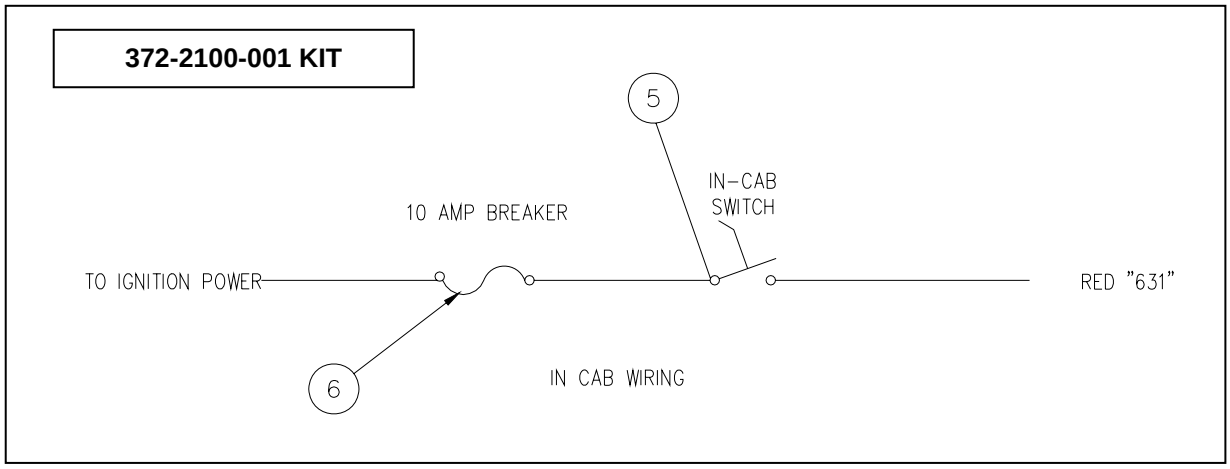


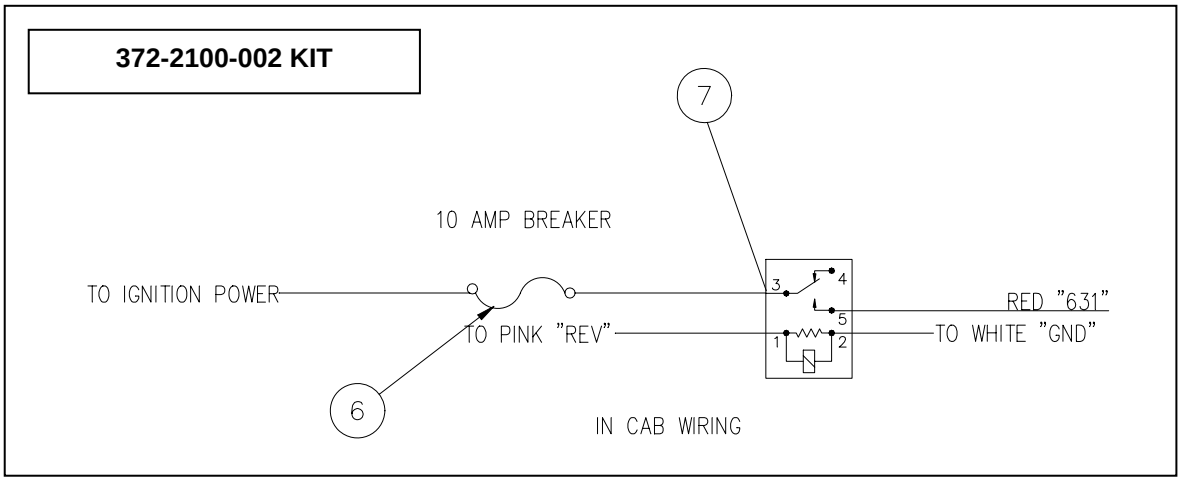


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SIDE MOUNTED TRAPEZODIAL LIGHT KIT
372-2100-001 – (SWITCH IN CAB)
372-2100-002 – (ON IN REVERSE)

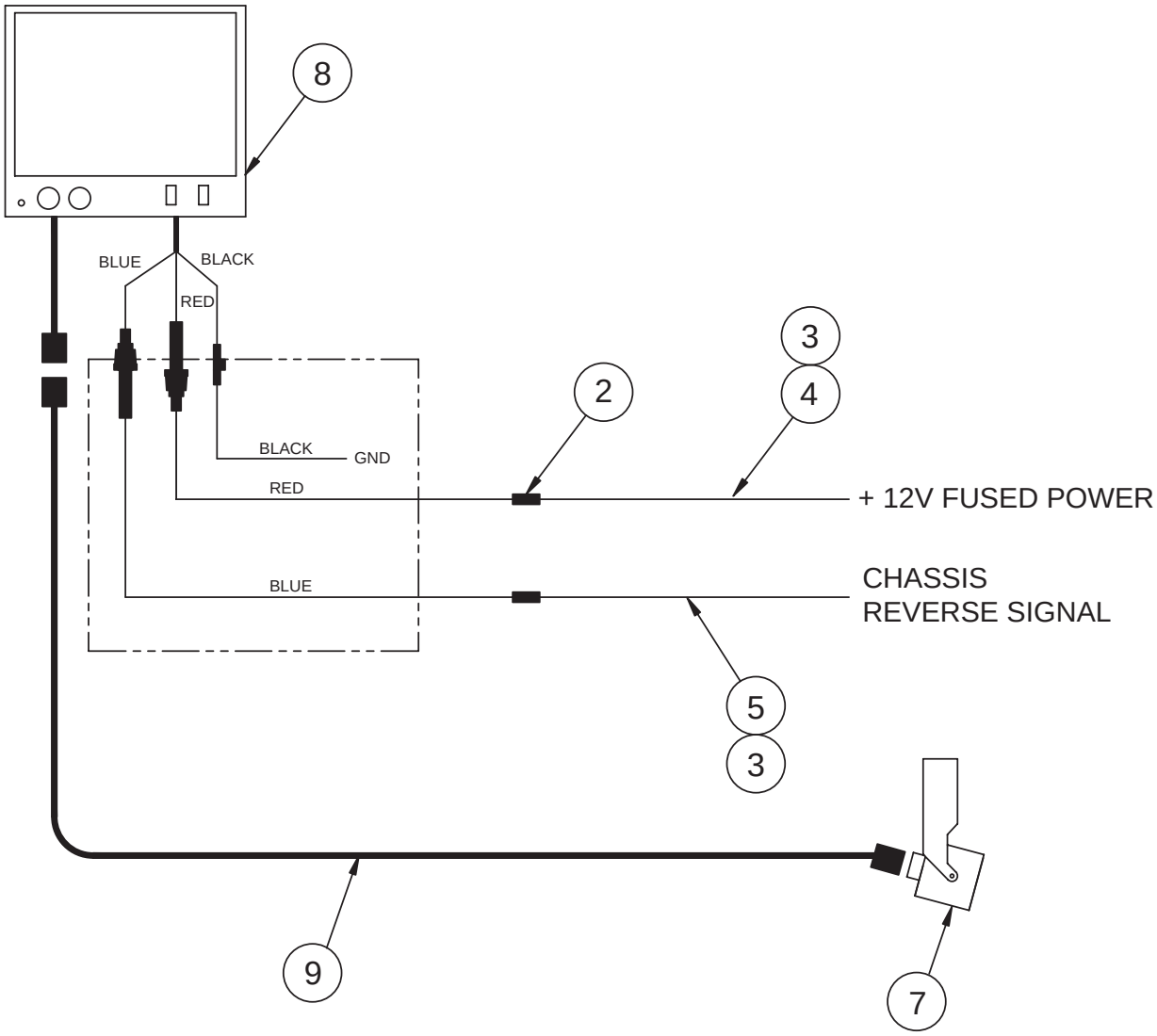
REF	PART NO.	DESCRIPTION	REQ'D
1	108-1814	SWITCH, toggle – 372-2100-001 kit	1
2	035-3421	GUARD, light	2
3	108-1493	GROMMET	2
4	115-1224	LIGHT, trapezoidal	2
	115-0916	LIGHT	1
	108-6416-012	RECEPTICLE, 2-pin	1
	108-7336-002	LOOM	1 ft
5	311-0655	BRACKET	2
6	108-4867-005	BREAKER, circuit – 10 AMP	1
7	069-0032	RELAY, micro – 372-2100-002 kit	1





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INTEC CAMERA KITS
372-3343 THRU 372-3346



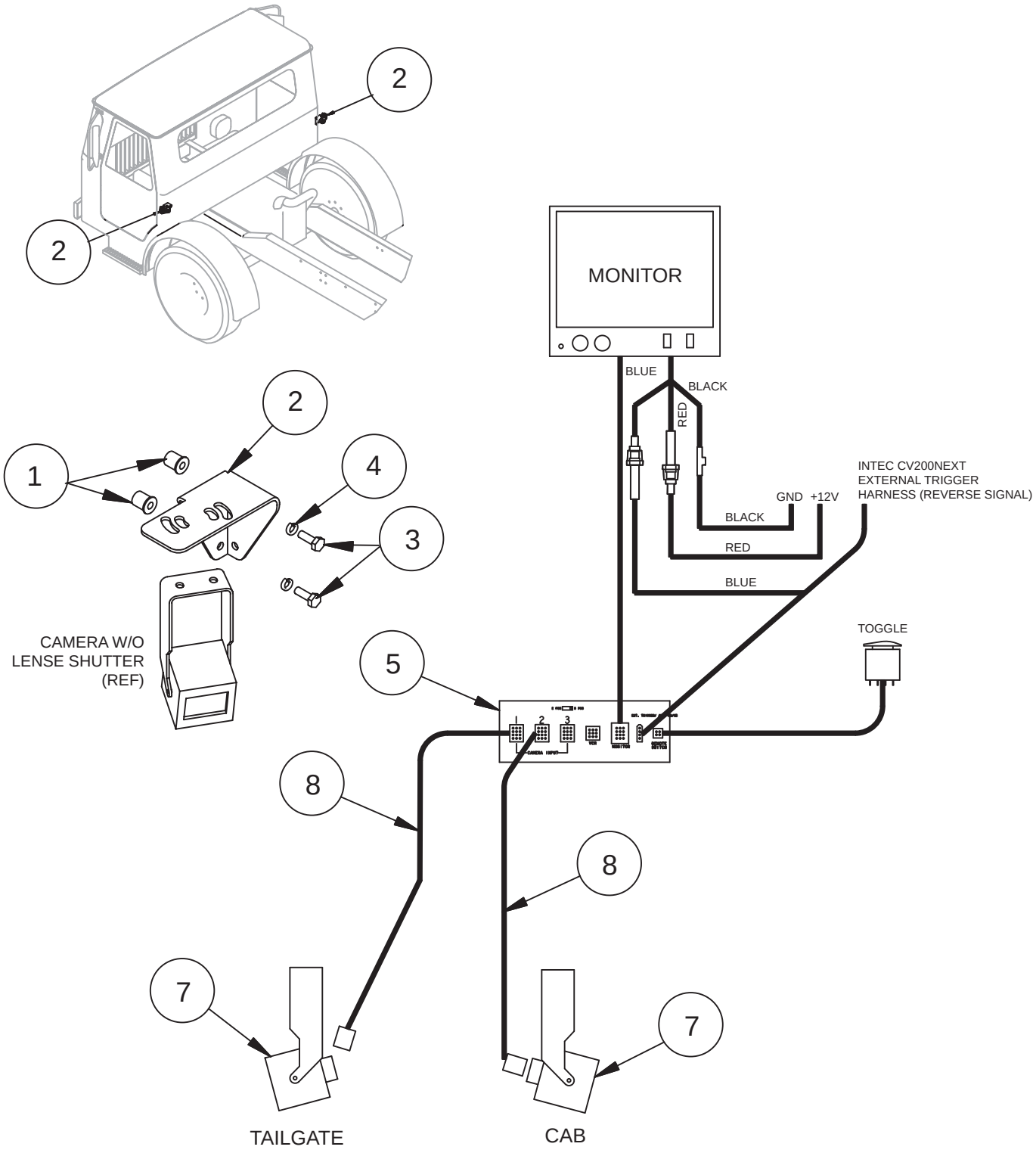
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INTEC CAMERA KITS
372-3343 THRU 372-3346

REF	PART NO.	DESCRIPTION	REQ'D
1	036-1640-208	TIES, nylon wire	A/R
2	108-1110-002	BUTT CONNECTOR	2
3	108-5034-003	LOOM, convoluted 1/2"	A/R
4	108-5233-009	WIRE, red 16GA	A/R
5	108-5233-023	WIRE, pink 16GA	A/R
6	161-0351	KIT, camera - for 372-3343 & 372-3345	1
	161-0352	KIT, camera – for 372-3344 & 372-3346	1
7	161-0398-001	CAMERA without shutter – for 372-3343 & 372-3345	1
	161-0352-001	CAMERA with shutter/heater – for 372-3344 & 372-3346	1
8	161-0352-002	MONITOR	1
9	161-0163-001	CABLE	1

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INTEC CAMERA KIT, LEFT/RIGHT HAND CAB
2ND CAMERA
ALL UNITS
372-3367 thru 372-3370



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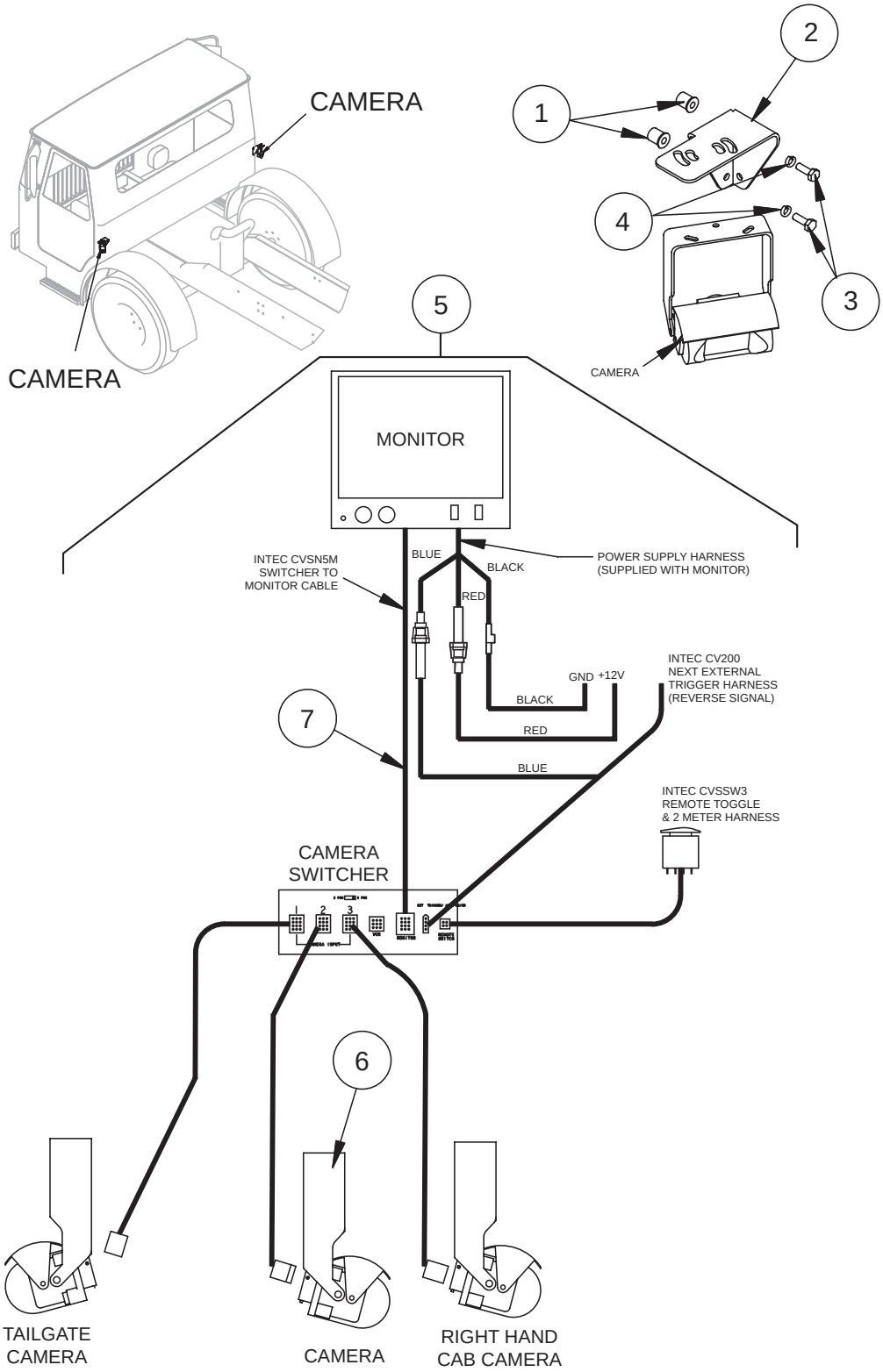
INTEC CAMERA KIT, LEFT/RIGHT HAND CAB
2ND CAMERA
ALL UNITS
372-3367 thru 372-3370

REF	PART NO.	DESCRIPTION	REQ'D
1	047-2192	WELL NUT	2
2	211-9334	BRACKET, camera mounted left hand cab side	1
	311-3754	BRACKET, camera mounted right hand cab side	1
3	FS070715	SCREW, hex head cap 1/4" – 20 x 3/4" plated	2
4	FS540700	LOCKWASHER, 3/8"	2
5	161-0412	SWITCHER, INTEC	1
6	161-0426	CAMERA KIT, INTEC N/S, cab mount	1
7	161-0398-001	CAMERA, without shutter	1
	161-0352-001	CAMERA, shutter	1
8	161-0163-004	CABLE, OVXLP6MA	1

372-3367	**INTEC CV210 AHXL CAMERA (HEATED WITH AUDIO) (DOES NOT HAVE LENSE SHUTTER)**
372-3368	**INTEC CVC210 AHXL CAMERA (HEATED WITH AUDIO) (DOES NOT HAVE LENSE SHUTTER)**
372-3369	**INTEC CVC230SHXL CAMERA (HEATED WITH LENSE SHUTTER) (DOES NOT HAVE AUDIO CAPABILITY)**
372-3370	**INTEC CVC230SHXL CAMERA (HEATED WITH LENSE SHUTTER) (DOES NOT HAVE AUDIO CAPABILITY)**

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INTEC CAMERA KITS, LEFT HAND/RIGHT HAND CAB 3RD CAMERA LOCATION
372-3375 thru 372-3378



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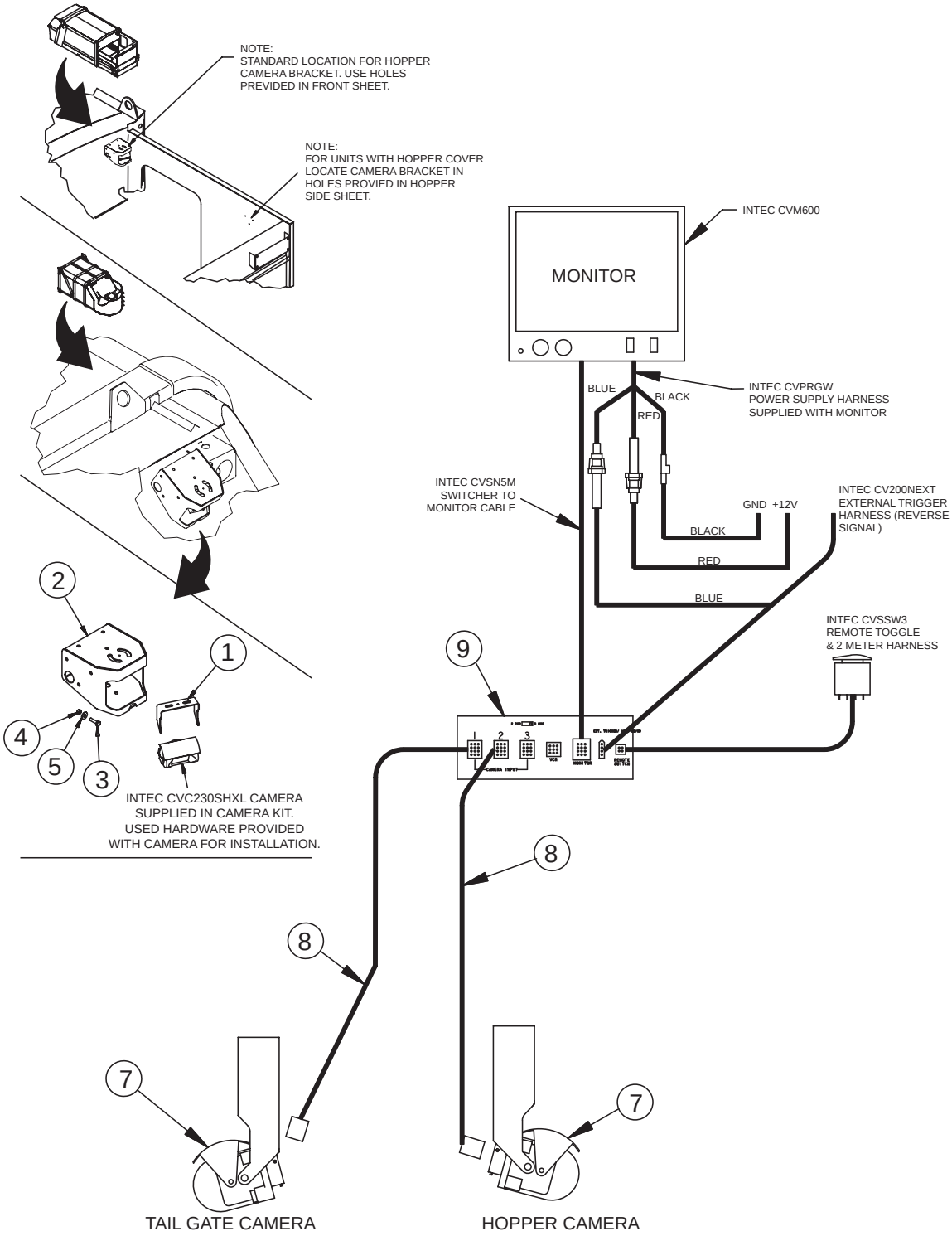
INTEC CAMERA KITS, LEFT HAND/RIGHT HAND CAB 3RD CAMERA LOCATION 372-3375 thru 372-3378

REF	PART NO.	DESCRIPTION	REQ'D
1	047-2192	WELL NUT	2
2	211-9334	BRACKET, camera mounted left hand cab side	1
	311-3754	BRACKET, camera mounted right hand cab side	1
3	FS070715	SCREW, hex head cap 1/4" – 20 x 3/4" plated	2
4	FS540700	LOCKWASHER, 3/8"	2
5	161-0429	CAMERA KIT, shut, cab mount	1

372-3375 INTEC CVC210 AHXL CAMERA (HEATED WITH AUDIO) (DOES NOT HAVE A LENSE SHUTTER)
372-3376 INTEC CVC210 AHXL CAMERA (HEATED WITH AUDIO) (DOES NOT HAVE A LENSE SHUTTER)
372-3377 INTEC CVC230SHXL CAMERA (HEATED WITH LENSE SHUTTER) (DOES NOT HAVE AUDIO CAPABILITY)
372-3378 INTEC CVC230SHXL CAMERA (HEATED WITH LENSE SHUTTER) (DOES NOT HAVE AUDIO CAPABILITY)

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INTEC SHUTTER CAMERA KIT INSTALLED IN HOPPER
372-3353



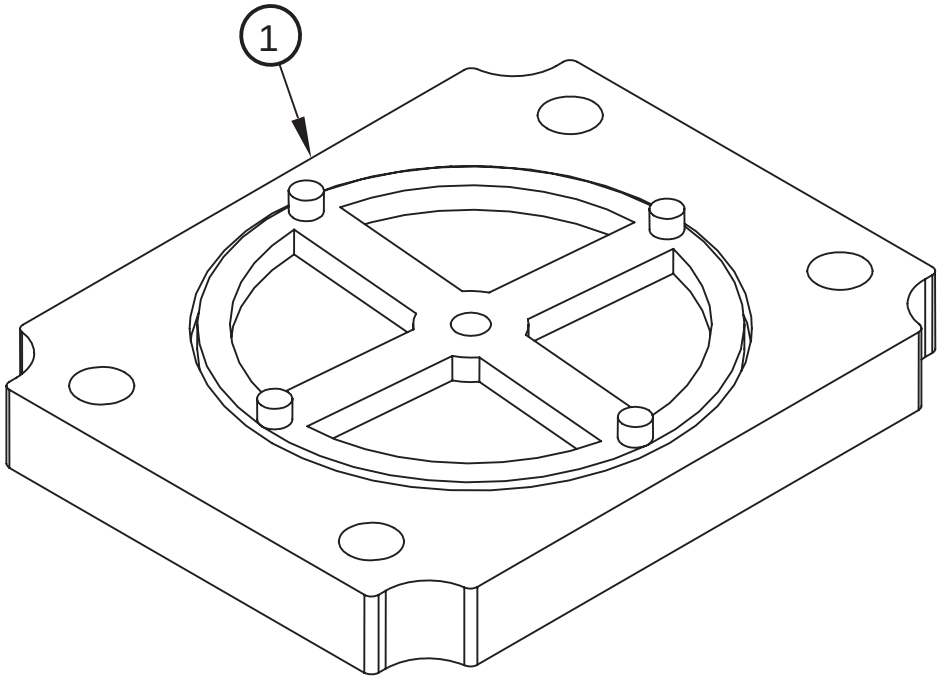
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INTEC SHUTTER CAMERA KIT INSTALLED IN HOPPER
372-3353

REF	PART NO.	DESCRIPTION	REQ'D
1	311-3671	BRACKET, camera CVC230	1
2	311-3673	ENCLOSURE, camera bracket	1
3	FS070720	BOLT – 1/4" –NC x 1"	3
4	FS230700	LOCKNUT, 1/4" – 20NC	3
5	FS520700	WASHER, flat 1/4" SAE	3
6	161-0431	CAMERA KIT, hopper shutter INTEC	1
7	161-03552-001	CAMERA, shutter CYC230SHXL	1
8	161-0404-001	CABLE, INTEC CVXLP32MA	1
9	161-0412	SWITCHER, UNTEC	1

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BASE, MONITOR SWIVEL
161-0179



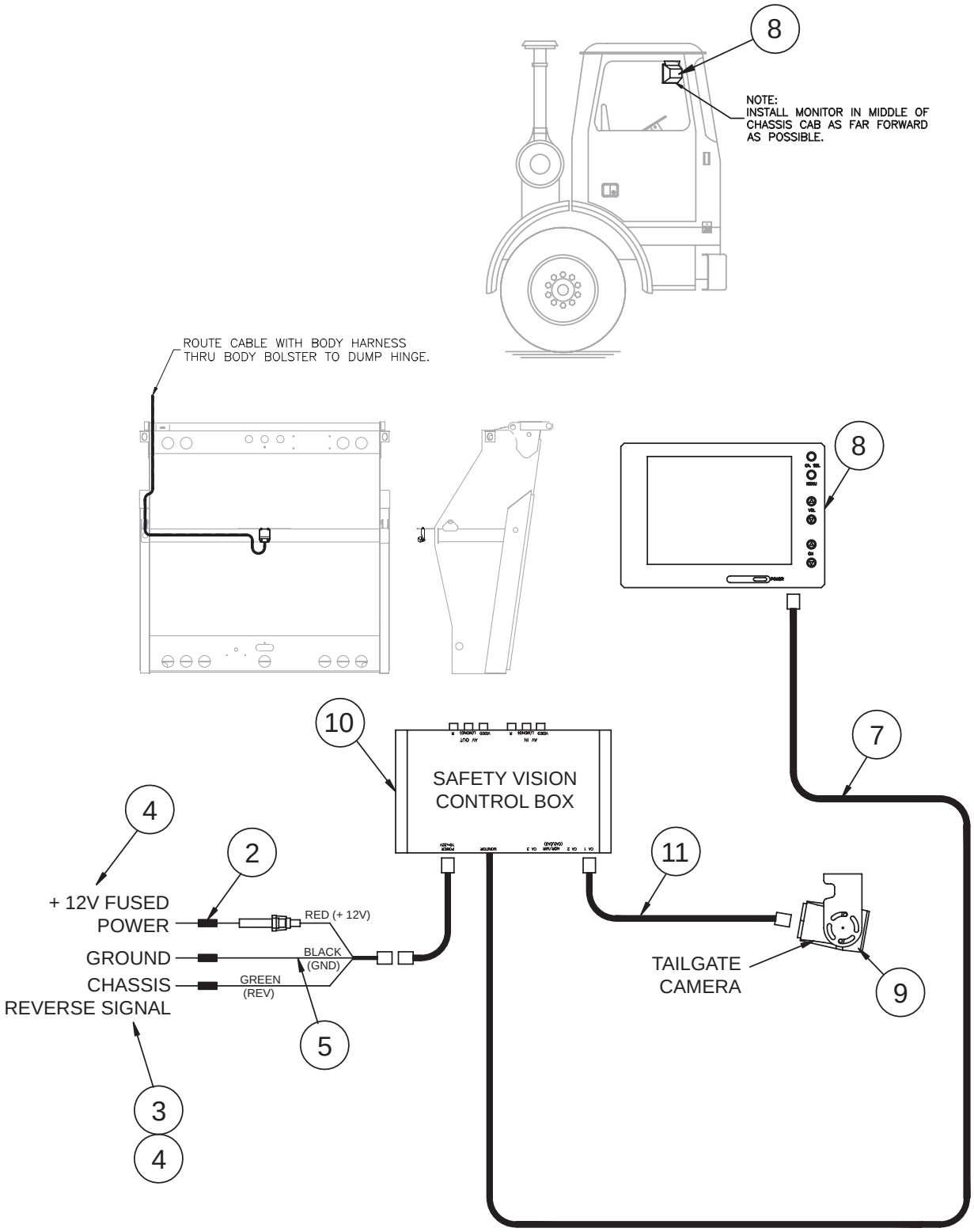
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BASE, MONITOR SWIVEL
161-0179

REF	PART NO.	DESCRIPTION	REQ'D
1	161-0179	BASE, monitor swivel	1

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SAFETY VISION CAMERA KIT, CAB ROOF MOUNTED
372-3350



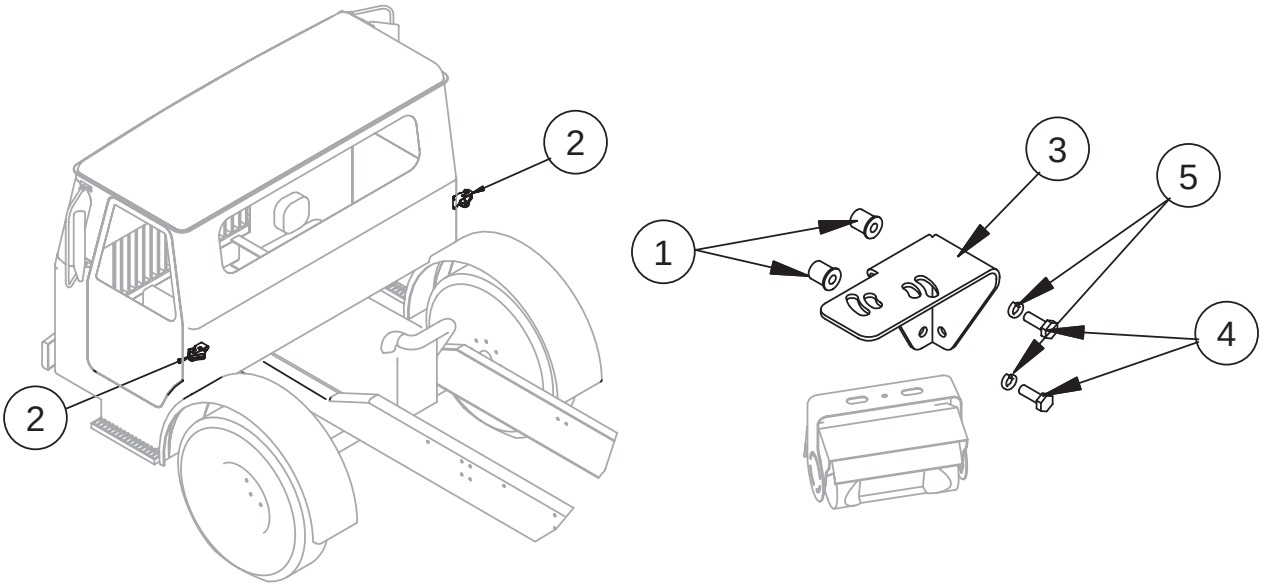
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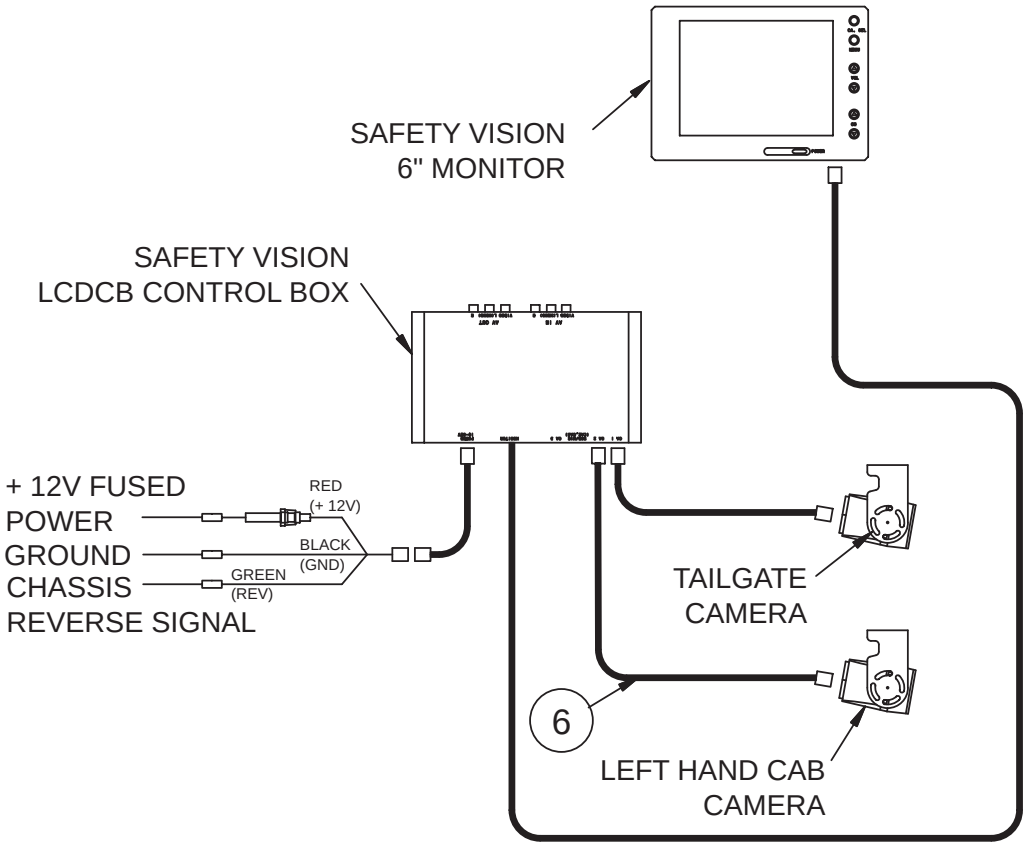
SAFETY VISION CAMERA KIT, CAB ROOF MOUNTED
372-3350

REF	PART NO.	DESCRIPTION	REQ'D
1	036-1640-208	TIES, nylon wire	A/R
2	108-1110-002	BUTT CONNECTOR	3
3	108-5034-003	LOOM, convoluted 1/2"	A/R
4	108-5233-009	WIRE, red 16GA	A/R
5	108-5233-022	WIRE, white 16GA	A/R
6	108-5233-023	WIRE, pink 16GA	A/R
7	161-0403	SINGLE CAMERA KIT	1
8	161-0403-001	MONITOR, SV-LCD68	1
9	161-0403-002	CAMERA, SAFETY VISION, SV-620	1
10	161-0403-003	CONTROL BOX, SVLCDCB	1
11	161-0404-004	CABLE, monitor to camera	65'

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SAFETY VISION CAMERA KITS, 2ND CAMERA LOCATION
372-3373 – LH CAB MOUNTED
372-3374 – RH CAB MOUNTED





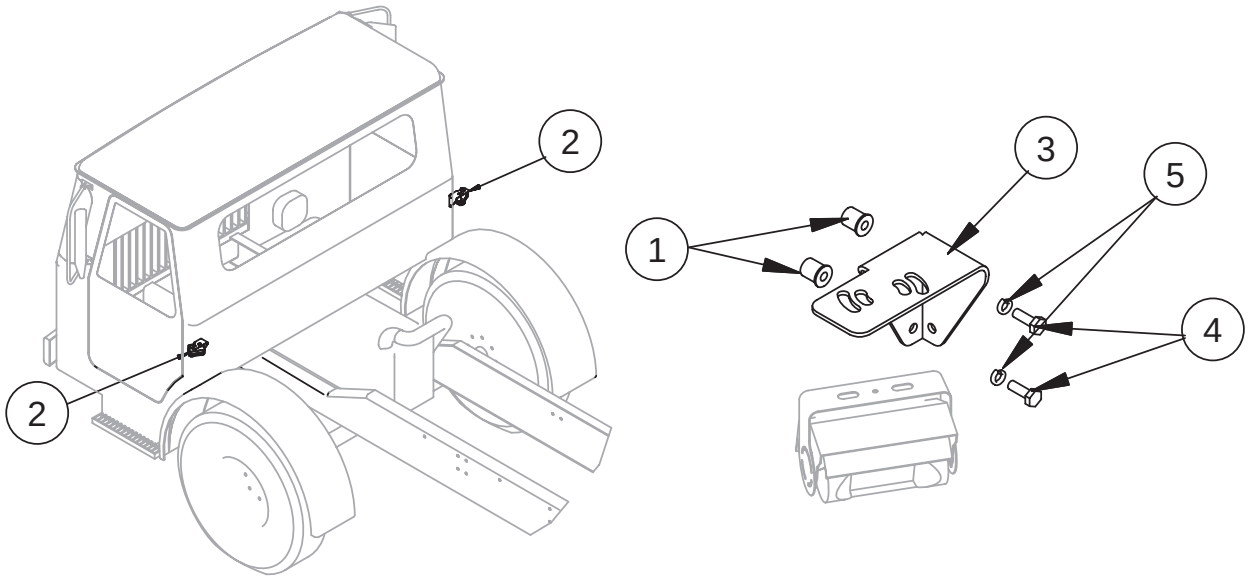
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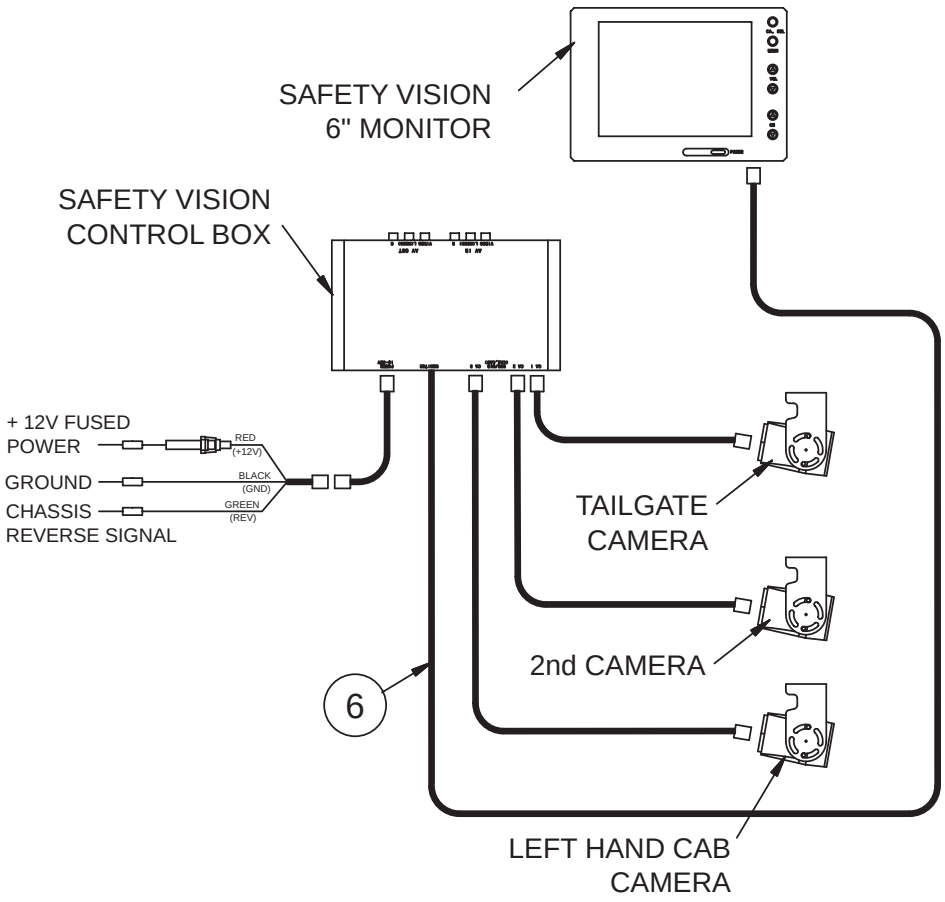
SAFETY VISION CAMERA KITS, 2ND CAMERA LOCATION
372-3373 – LH CAB MOUNTED
372-3374 – RH CAB MOUNTED

REF	PART NO.	DESCRIPTION	REQ'D
1	047-2192	NUT, well	2
2	FS540700	WASHER, lock - 3/8"	2
3	211-9334	BRACKET, camera mounted left hand cab side	1
	311-3754	BRACKET, camera mounted right hand cab side	1
4	FS070715	CAPSCREW, 1/4" – 20NC x 3/4" plated	2
5	161-0408	CAMERA KIT - dual	1
6	161-0403-002	CAMERA – (safety vision SV-620	2
7	161-0408-003	CABLE – 65'	2
8	161-0408-004	CABLE EXTENSION – 65'	1
9	161-0403-001	MONITOR	1
10	161-0403-003	BOX, control	1
11	161-0403-004	CABLE, monitor to box	1

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SAFETY VISION CAMERA KITS, 3RD CAMERA LOCATION
372-3381 – LH CAB MOUNTED
372-3382 – RH CAB MOUNTED





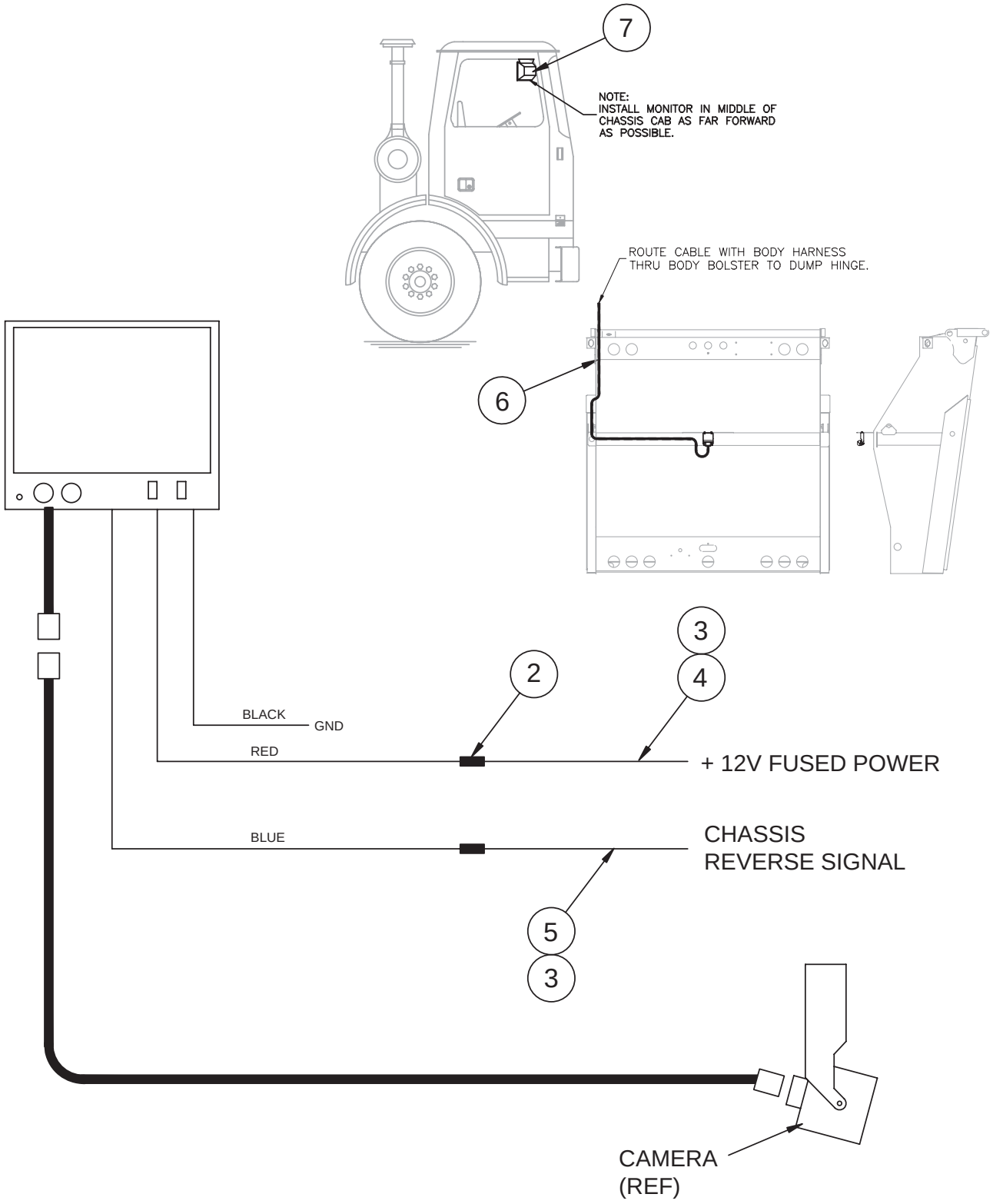
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SAFETY VISION CAMERA KITS, 3RD CAMERA LOCATION
372-3381 – LH CAB MOUNTED
372-3382 – RH CAB MOUNTED

REF	PART NO.	DESCRIPTION	REQ'D
1	047-2192	NUT, well	2
2	161-0403-002	CAMERA, safety vision, SV-620	1
3	211-9334	BRACKET, camera mounted left hand cab side	1
	311-3754	BRACKET, camera mounted right hand cab side	1
4	FS070715	SCREW, hex head cap 1/4" – 20 x 3/4" plated	2
5	FS540700	WASHER, lock - 3/8"	2
6	161-0408-003	CAMERA CABLE, SAFVIS SV-513	A/R

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CUSTOMER SUPPLIED TAILGATE CAMERA KITS
372-3386 - MONITOR MOUNTED ON DOGHOUSE
372-3387 – MONITOR MOUNTED ON CAB ROOF



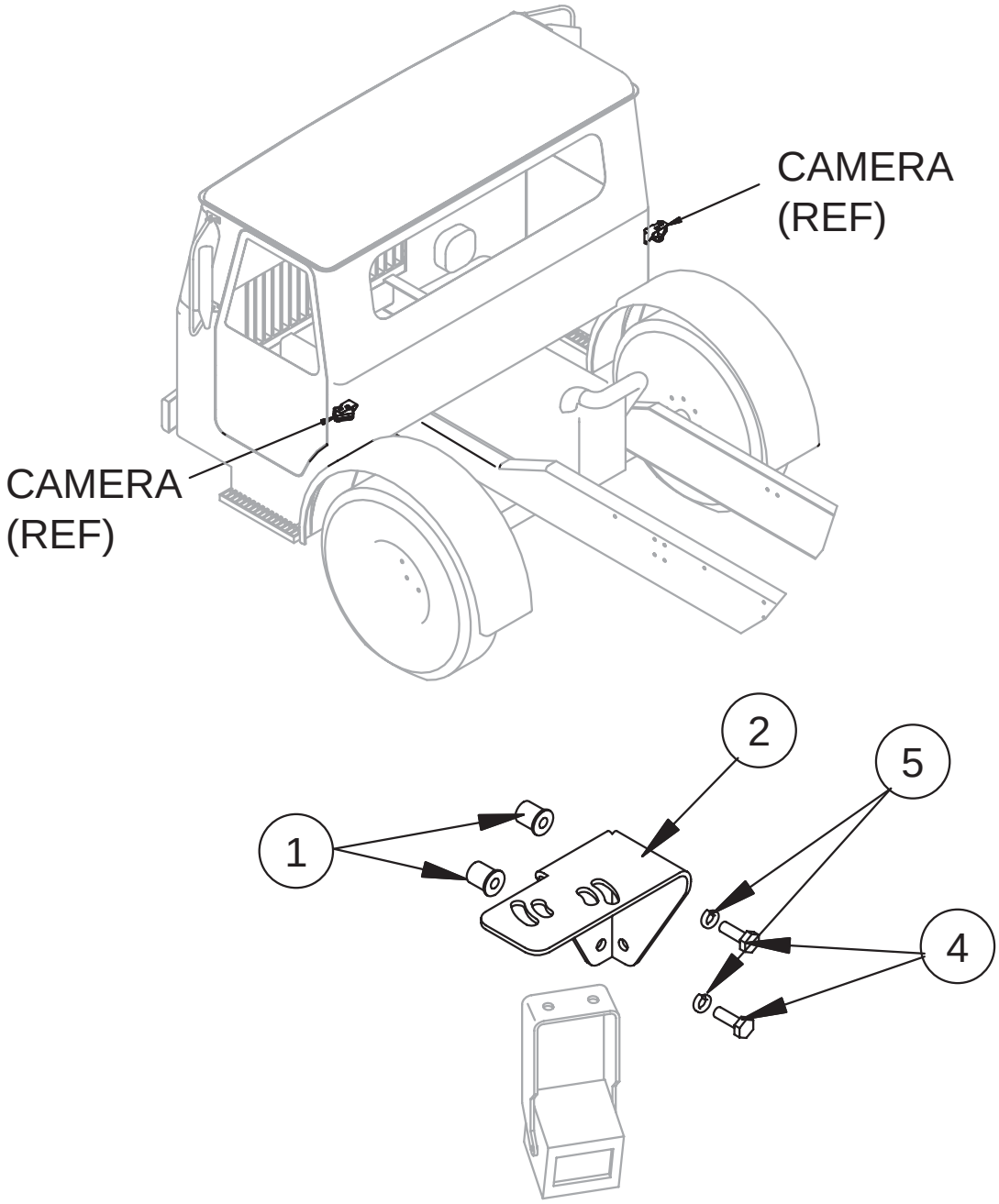
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CUSTOMER SUPPLIED TAILGATE CAMERA KITS
372-3386 - MONITOR MOUNTED ON DOGHOUSE
372-3387 – MONITOR MOUNTED ON CAB ROOF

REF	PART NO.	DESCRIPTION	REQ'D
1	036-1640-208	TIE, nylon wire	A/R
2	108-1110-002	CONNECTOR, butt	2
3	108-5034-003	LOOM, convoluted 1/2"	A/R
4	108-5233-009	WIRE, red 16GA	A/R
5	108-5233-023	WIRE, pink 16GA	A/R
6	372-3340	CAMERA INSTALLATION	1
7	- - -	MONITOR, customer supplied	1

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CAMERA KITS, CUSTOMER SUPPLIED
2ND OR 3RD CAMERA
372-3388 – LH CAB MOUNTED
372-3389 – RH CAB MOUNTED



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CAMERA KITS, CUSTOMER SUPPLIED
2ND OR 3RD CAMERA
372-3388 – LH CAB MOUNTED
372-3389 – RH CAB MOUNTED

REF	PART NO.	DESCRIPTION	REQ'D
1	047-2192	WELL NUT	2
2	211-9334	BRACKET, camera mounted left hand cab side	1
	311-3754	BRACKET, camera mounted right hand cab side	1
3	FS070715	SCREW, hex head cap 1/4" – 20 x 3/4" plated	2
4	FS540700	LOCKWASHER, 3/8"	2

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DuraPack® 5000



SERVICE MANUAL

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SWS-706070-SM-0110

Customer Support

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WARNING

IF INCORRECTLY USED, THIS EQUIPMENT CAN CAUSE SEVERE INJURY, THOSE WHO USE AND MAINTAIN THE EQUIPMENT SHOULD BE TRAINED IN ITS PROPER USE, WARNED OF ITS DANGERS, AND SHOULD READ AND FULLY UNDERSTAND THE ENTIRE MANUAL BEFORE ATEMPTING TO SET UP, OPERATE, ADJUST OR SERVICE THE EQUIPMENT. KEEP THIS MANUAL FOR FUTURE REFERENCE

IMPORTANT SAFETY NOTICE

Proper service and repair are important to the safe, reliable operation of the Heil Co.'s products. Service procedures recommended by Heil are described in this service manual and are effective for performing service operations. Some of these service operations may require the use of tools or blocking devices specially designed for the purpose. Special tools should be used when and as recommended. It is important to note that some warnings against the use of specific methods that can damage the product or render it unsafe are stated in the service manual. It is also important to understand these warnings are not exhaustive. Heil could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Heil has not undertaken any such broad evaluations. Accordingly, anyone who uses service procedures or tools which are not recommended by Heil must first satisfy himself thoroughly that neither his safety nor the product safety will be jeopardized by the method he selects.

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SERVICE MANUAL

SECTION 1
GENERAL INFORMATION

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SAFETY SYMBOLS AND DEFINITIONS

Listed below are the definitions for the various levels of safety hazards. It is important that the operators of this equipment read and understand safety messages as they relate to this equipment operation.

- **DANGER** – indicates an imminently hazardous situation, which if not avoided WILL result in DEATH or SERIOUS INJURY if you don't follow proper instructions.
- **WARNING** – indicates an imminently hazardous situation, which if not avoided COULD result in DEATH OR SERIOUS INJURY if you don't follow proper instructions.
- **CAUTION** – indicates an imminently hazardous situation, which if not avoided MAY result in MINOR to MODERATE INJURY if you don't follow proper instructions.
- **NOTICE** – means unit or other property may be damaged if these instructions are not followed.

The following safety messages are generally in the Operator's Manual for each specific unit or are generic safety messages if an Operator's Manual does not have these safety messages. Other safety alert messages may be in other sections of the Parts and Maintenance/Adjustment Manual, in other sections of the Parts and Service Manual or in an Operator's Manual. You must read and obey all safety alert messages in any manual produced by Heil to support your unit.

⚠ WARNING

Failure to follow all instructions and safety precautions in this manual, in the Maintenance and Adjustment (or Service) Manual, in other manufacturer's manuals and on the safety decals attached to the product could result in serious injury or death to operators or bystanders and/or damage to property.

DO NOT operate this vehicle before you READ and UNDERSTAND this Operator's Manual, the Parts and Maintenance/Adjustment (or Service) Manual for this unit, other applicable manufacturer's manuals and the safety decals on the product.

Each operator of this unit must read and understand all directions in this manual before they first operate this vehicle.

Keep this manual in the cab for new operators and to remind all operators about safe use.

⚠ DANGER **Do not operate the unit or perform repair or maintenance procedures on the unit until you read and understand all of the instructions in this manual. Failure to do so may result in injury or death to operators or bystanders.**

NOTICE **Do not operate the unit or perform repair or maintenance procedures on the unit until you read and understand the instructions in this manual. Failure to do so may result in damage to the unit or other property.**

NOTE: If you do not understand a procedure or instruction, tell the owner or the designated person immediately. Do not operate the unit if you do not understand all procedures and instructions in this manual. The owner or designated person can contact your Heil dealer or Heil for additional help. See page *(given in specific Operator's Manual)* for contact information.

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WARNING **Moving equipment can be dangerous to bystanders. Serious injury or death can occur if a person is in the wrong area or is not attentive to the operations. Clear the area of all unnecessary people before you operate the controls.**

DANGER **Do not enter the hopper unless the unit is in the lock-out mode. When the unit is not in the lock-out mode and a person is in the hopper, the packer panel or the crusher panel can be operated. Serious injury or death may occur if the packer panel or the crusher panel moves while a person is in the hopper.**

DANGER **Always prop the tailgate when you leave it raised for maintenance, service or cleaning procedures. Any part of your body between the unit's body and the tailgate while you prop the tailgate or when the tailgate is propped is dangerous. Serious injury or death may occur if any part of your body is between the tailgate and the body if the tailgate suddenly closes.**

DANGER **A tailgate in motion is dangerous. Serious injury or death may occur if a person is struck by a moving tailgate or becomes trapped between the tailgate and the body. Clear the area near the tailgate of all unnecessary people before you lower the tailgate.**

DANGER **The packer and crusher panels are dangerous. They can cause serious injury or death if a person is inside the hopper. Make sure no one is inside the hopper before you begin a packer or crusher function. Put the unit in the lock-out mode if a person is in the hopper.**

DANGER **Any part of your body between the unit's body and the chassis or cylinders while you raise the body is dangerous. Serious injury or death will occur if the unit's body suddenly lowers and traps a part of your body. Keep all parts of your body out from underneath the unit's body and away from the cylinders during this procedure.**

DANGER **Do not raise a body that has refuse while you do maintenance or service procedures. Refuse in the body can make the unit unstable. Always unload refuse from the body before you raise it for maintenance or service procedures. Always use the body props when you raise the body for maintenance or service procedures.**

WARNING **Raising the body with the tailgate closed can damage the underride bumper. The underride bumper can hit the ground when the tailgate is not fully raised before you raise the body. Serious injury or death may occur and also cause damage to the unit.**

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WARNING **Clear all people of the area before you lift a refuse container. Make sure the refuse is secure in the refuse container before you lift the container. Loose refuse can fall and cause serious injury or death.**

CAUTION **Grabbing a refuse container with too much pressure can damage the container. Pieces of the container can "fly" off the container and cause moderate or minor injury to a bystander. Use enough pressure with the grabber to raise the container with the lift arm and not damage the container.**

NOTICE **Grabbing a refuse container with too much pressure can damage the container. The container can become unusable. Use enough pressure with the grabber to raise the container with the lift arm and not damage the container.**

CAUTION **A container that is not locked to the container lift mechanism is dangerous. The container can fall off the container lift mechanism and cause minor or moderate injury. Make sure you engage and lock the container latch bars before you lift the container.**

WARNING **Make sure the unit is in the lock-out mode when you do maintenance or service procedures, or when you go in the hopper, climb on the body or equipment. Equipment can be operated when the unit is not in the lock-out mode. When the unit is not in the lock-out mode, equipment operated while you do maintenance or service procedures, go in the hopper or climb on the body or equipment can cause serious injury or death.**

DANGER **Make sure the unit is on firm, stable ground before you raise the body and clear the area of all unnecessary people. Do not prop a body unless it is on firm, stable ground. A unit not on firm, stable ground may roll when raising or propping the body. This may cause serious injury or death to you or bystanders.**

DANGER **This procedure is dangerous if not performed correctly or equipment fails. Serious injury or death may occur from equipment falling or breaking. Clear the area of all people not necessary for the procedures and correctly perform the procedure. Do not go under the chassis during this procedure.**

DANGER **A full or partially full load of refuse is dangerous while you lower the body with inoperative controls. Refuse in the body can make the unit unstable and cause it to overturn. Serious injury or death may occur if the unit overturns due to instability caused by the loaded refuse. REMOVE the refuse before you block the body.**

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DANGER Lifting equipment that does not have sufficient lifting capability is dangerous. Equipment may fail and cause serious injury or death to the operator or bystanders. Make sure the lifting equipment has sufficient lifting capability and clear ALL persons not involved with the procedure away from the area.

DANGER **The lifting equipment may fail. Serious injury or death may occur if the lifting equipment breaks and the body falls or the unit rolls over. Do not place your body or limbs between the unit's body and chassis while you remove the body-supporting timbers. Be attentive and prepared to move quickly away from the unit in the event there is an equipment failure.**

WARNING **The hydraulic fluid may be under pressure and may spray while you open the connection. Hydraulic fluid may cause damage to your eyes, hands or skin. Wear protective eye glasses, gloves and other clothing as necessary to protect you from the hydraulic fluid.**

WARNING **A unit that needs service or repair can malfunction and create a dangerous condition. A part failure during operation can cause serious injury or death to a person or damage to the unit. Repair or replace any failed or defective part immediately.**

DANGER **Contact of the unit with overhead electric lines is dangerous. Serious injury or death may occur. Make sure there is adequate overhead clearance before you raise the container. If the unit does make contact with overhead electric lines do not touch any metal in the cab. Stay in the unit until help arrives.**

NOTICE **Grabbing a refuse container with too much pressure can damage the container. The container can become unusable. Use enough pressure with the grabber to raise the container with the lift arm and not damage the container.**

WARNING **Improper dumping of the refuse may cause the unit to tip or rollover. Serious injury or death may occur if the unit rolls or tips over. Empty as much refuse as you can with the packer panel before you raise the body.**

DANGER **Make sure the unit is on firm, stable ground before you raise the body and clear the area of all unnecessary people. Do not prop a body unless it is on firm, stable ground. A unit not on firm, stable ground may roll when raising or propping the body. This may cause serious injury or death to you or bystanders.**

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WARNING **Do not move the unit forward or backwards excessively fast (lurch) to dump the refuse load. Excessively fast movements with the body raised may make the body unstable and tip or roll the unit over. This may result in injury or death to the operator and damage the unit. Use only sufficient movement to loosen the load so that it will leave the body.**

NOTICE **Do not move the unit forward or backwards excessively fast (lurch) to dump the refuse load. Excessively fast movements with the body raised puts a very high load on the body raise cylinders and could damage one or both cylinders and make the body unstable unable to lower. Inspect the cylinders after you dump each load and replace if necessary.**

WARNING **Isopropyl alcohol is flammable and is harmful to eyes and skin. Keep isopropyl alcohol away from heat or open sources of ignition. Flush eyes and skin with water for 15 minutes after contact. Seek immediate medical help.**

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LOCK-OUT/TAG-OUT PROCEDURES

Put the unit in a lock-out condition:

- **BEFORE** you enter the unit's body.
- **BEFORE** you climb or stand on the body or roof.
- **BEFORE** you do maintenance or repair procedures on the unit.

► Follow These Steps:

1. TURN the ignition switch to OFF.
2. APPLY the brakes. **MAKE SURE** the brakes do not let the unit move and they work properly.
3. CHOCK all wheels.
4. REMOVE the ignition key from the cab.
5. Put a LOCK-OUT TAG onto the STEERING WHEEL.



Lock-out (Do Not Operate) Tag

NOTE: You can order lock-out tags (Part No. 212-1586) through your Heil Dealer or through Heil.

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IMPORTANT!

- Before starting any maintenance, study this section of the manual.
- Read all safety messages and decals on the unit.
- Clear the area of other persons before performing any maintenance.
- Know and understand safe use of all controls.
- It is your responsibility to understand and follow manufacturer's instructions on equipment and care.

SAFETY DECALS ON THE UNIT

Make sure you can read all safety and instruction decals. Clean decals if you cannot read the words. See page 115 for directions on cleaning decals.

Decals must be replaced if the decal is damaged, the decal is missing, or the decal is not readable.

If a decal is on a part that is replaced, make sure a new decal is installed on the new part. See the Parts and Maintenance/Adjustment (Service) manual for a complete decal kit and individual decals. Order the decal kit or individual decals from your Heil Dealer or from Heil.

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INTRODUCTION

The following sections are a guide for maintenance and service of the Heil unit. It covers preventive maintenance, adjustment and troubleshooting hints.

In order to diagnose a problem quickly and effectively, a service person must be thoroughly familiar with the machine. This section explains the system and major components to give that knowledge. Diagrams and schematics of the electrical and hydraulic systems are at the back of the Parts and Maintenance/Adjustment Manual or when you have a Parts and Service Manual with 10 Service Manual Sections, they are in Service Manual Section 10.

SERVICE/PARTS ASSISTANCE

Assistance in troubleshooting repair and service is available by contacting the authorized Heil Dealer in your area. Heil personnel are trained to give prompt, professional assistance.

ALWAYS give the machine model and serial number in all correspondence relating to the equipment.

LUBRICATION INFORMATION

Before performing maintenance, check the job carefully to find all the hazards present and make sure all necessary safeguards or safety devices are used to protect all persons and equipment involved.

HYDRAULIC OIL SPECIFICATIONS

Heil hydraulic oil (MV32) contains the following specifications.

Gravity	°API (ASTM D-287) 31.0
Specific Gravity @ 60°F (15.6°C)	(ASTM D-287) 0.8780
Flash Point	(ASTM D-92) 410°F
Pour Point	(ASTM D-97) -60°F
Viscosity @100°F @210°F	 SUS (ASTM D-445 & ASTM D-2161) 153 SUS (ASTM D-445 & ASTM D-2161) 47.3
Viscosity Index	(ASTM D-2270) 155
Rust Protection	(ASTM D-665 A & B) Pass
Foam Test	(ASTM D-892) Pass
Four-Ball Wear Test	(ASTM D-4172) (40kg, 1800RPM), 130°F, 1 hr) 0.66
Zinc %wt.	(XRF) .04

NOTE: Cold weather operation requires special oil considerations. Viscosity should not exceed 7500 SSU at lowest startup temperature. Continuous operation should range between 40-1000 SSU for all temperature ranges.

The following oils by brand name are approved for use in the hydraulic system on this equipment and considered to be all temperature hydraulic fluids.

- Pennzoil Pennzbell AWX MV32
- Mobil DTE 13M
- Shell Tellus T32
- Texaco Rando HDZ 32

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OIL CAN LUBRICANT RECOMMENDATION

Use only non-detergent engine oil to lubricate all moveable mechanical parts not furnished with grease fittings. Apply sufficient oil to give good lubrication, but do not bathe parts in oil. Always wipe off excess.

GREASE LUBRICANT RECOMMENDATION

Use a grease gun. Before engaging grease gun, clean the fitting. Always pump enough grease to purge the joint of contaminated grease and wipe off the excess.

WINCH GEAR OIL

Use AGMA Grade 5 EP (90wt.) for a 8,000 lb. winch and AGMA Grade 7 EP (140 wt.) for a 12,000 lb. winch.

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STANDARD TORQUE DATA FOR NUTS AND BOLTS

The following recommended torque data is for use as a general guideline.

NOTE: Torque specifications on a drawing override torque values in the table below.

Recommended torque, in foot pounds, for all Standard Application nuts and bolts provided:

- All thread surfaces are clean and lubricated with SAE-30 engine oil. (See note.)
- Joints are rigid, that is no gaskets or compressible materials are used.
- When re-using nuts or bolts use minimum torque values.

NOTE: Multiply the standard torque by:

- .65 when finished jam nuts are used.
- .70 when Molykote, white lead or similar mixtures are use as lubricants.
- .75 when parkerized bolts or nuts are used.
- .85 when cadmium plated bolts or nuts and zinc bolts w/waxed zinc nuts are used.
- .90 when hardened surfaces are used under the nut or bolt head.

Bolt or Stud	Type 1 Studs Only		Type 1 Bolts 6" or less		Type 1 Bolts Longer than 6"		Type 5 All Lengths		Type 8 All Lengths			
									Only when used in cast (gray) iron*		All other applications	
Diameter	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1/4	5	6	5	6	3	3	9	10	11	13	12	14
5/16	12	13	12	13	6	7	19	21	24	27	27	30
3/8	21	24	21	24	11	13	33	37	43	47	45	50
7/16	35	38	35	38	19	21	53	60	69	76	75	85
1/2	52	28	52	58	29	32	80	90	104	117	115	130
9/16	70	80	70	80	41	46	115	130	150	170	165	185
5/8	98	110	98	110	57	63	160	180	210	230	220	250
3/4	174	195	174	195	100	112	290	320	350	390	400	450
7/8	300	330	162	181	162	181	420	470	570	630	650	730
1	420	470	250	270	250	270	630	710	350	950	970	1090
1 1/8	600	660	350	380	350	380	850	950	1200	1350	1380	1550
1 1/4	840	940	490	540	490	540	1200	1350	1700	1900	1940	2180
1 3/8	1100	1230	640	710	640	710	1570	1760	2300	2500	2600	2800
1 1/2	1470	1640	850	940	850	940	2000	2300	3000	3300	3300	3700
1 3/4	2350	2450	1330	1490	1330	1490	3300	3700	4700	5200	5300	6000
2	3500	3900	2000	2200	2000	2200	5000	55000	7000	7800	8000	9000

*When bolt penetration is 1 1/2 times the diameter of the bolt.

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BOLT TYPE IDENTIFICATION CHART

IH Type	S.A.E. Grade	Description	Bolt Head Marking**
1	1 or 2	No radial lines. Low or medium carbon steel not heat treated. NOT USED, replace with same grade bolt.	
5	5	Three radial lines. Quenched and tempered medium carbon steel.	
8	8	Six radial lines. Quenched and tempered special carbon or alloy steel	

COLD WEATHER WARM UP PROCEDURE

When air temperatures are cold, it may be necessary to warm up the unit's hydraulic oil before you start your daily route operation. Follow these steps:

1. Start the truck and let the engine idle.
2. **APPLY** the parking brake and make sure it holds.
3. Engage the hydraulic pump for approximately five minutes.

WARNING **Moving parts on the unit are dangerous. Serious injury or death may occur if a person is struck by the equipment. Clear all people of the area before you operate the unit**

4. **MAKE SURE** the area around the unit is clear of all people before you operate the controls.
5. Operate the lift and body hydraulic functions through 10 (ten) cycles while the engine idles. This warms the hydraulic oil.
6. Check for fluid leaks again. Repair if necessary.
7. The unit is now ready to go on route.

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BATTERY DISCONNECT SWITCH

The figure below shows the location of a typical battery disconnect switch on the battery box. The battery box may look different and may be at a different location on different chassis. Become familiar with the location of the battery box and battery disconnect switch on your unit.

WARNING The battery disconnect switch must be turned off whenever the vehicle is not in service and/or to be left unattended.

Battery cables must be securely anchored and not rubbing other equipment. Cable insulation must be fee of damage and abrasion. Inspect weekly.



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DECAL CARE

It is important that the decals are properly cleaned to make sure that they are readable and do not come off the unit. Use the following steps to clean the decals.

GENERAL INSTRUCTIONS

Following these instructions helps the decals adhere longer.

- Wash the decals with a blend of mild car wash detergent and clean water.
- Rinse with clean water.
- Let the vehicle air-dry or dry with a micro-fiber cloth.
- Do not allow fuels to stay in contact with the decal for an extended period of time. Remove the fuel contamination as quickly as possible.
- Do not use carnauba-based wax over the decals.
- Do not use a mechanical brush while washing the decals.

PRESSURE WASHER PRECAUTIONS

Pressure washing can cause damage to decals. It can cause the edges of the decals to lift and peel the decal away from the unit. Over time, the decal can fade, crack or chip away.

Use pressure washing only when other cleaning methods are not effective. If you use a pressure washer, use the following precautions.

- Spray nozzle opening: 40° wide pattern
- Spray angle: 65° from vehicle' s body
- Distance of nozzle to decal: 15" minimum
- Water pressure: <= 800 psi
- Length of time: not more than 30 sec.
- Do not use sharp angles to clean the decals – this can lift the decals from the unit.
- NEVER use a "turbo pressure nozzle".

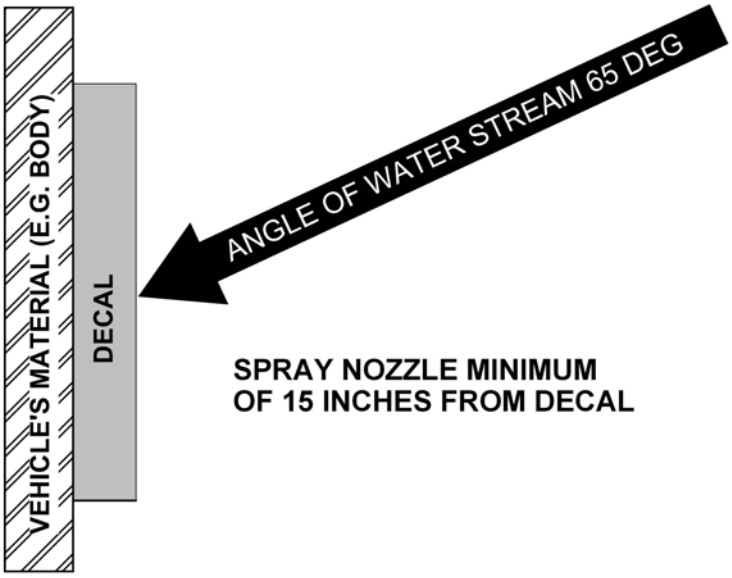
REMOVE DIFFICULT DEBRIS

When normal cleaning procedures do not remove difficult debris from the decals, try the following:

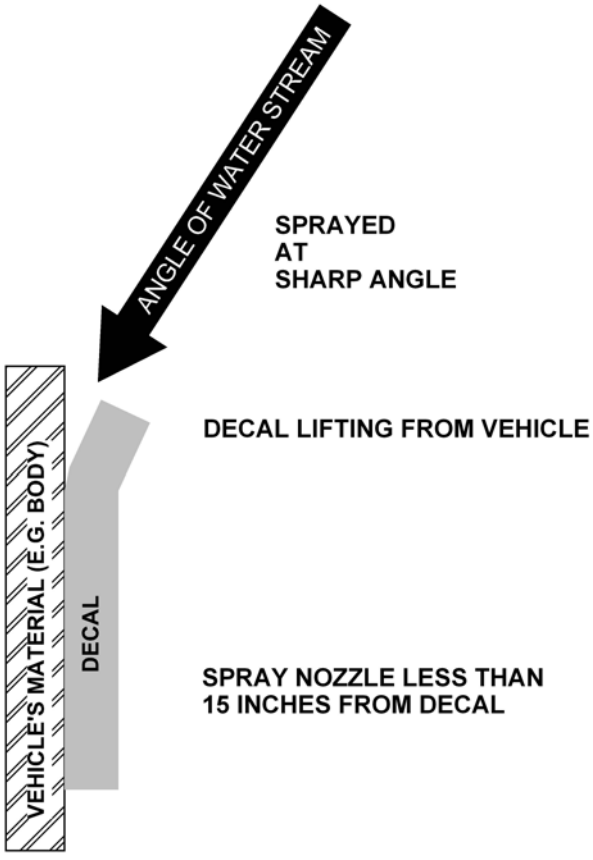
WARNING **Isopropyl alcohol is flammable and is harmful to eyes and skin. Keep isopropyl alcohol away from heat or open sources of ignition. Flush eyes and skin with water for 15 minutes after contact. Seek immediate medical help.**

- Spot clean the decal with Isopropyl Alcohol and a micro-fiber cloth (rag).
- If these methods do not work on a problem area, call a Heil Dealer or Heil Customer Support.

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RECOMMENDED TECHNIQUE



INCORRECT TECHNIQUE

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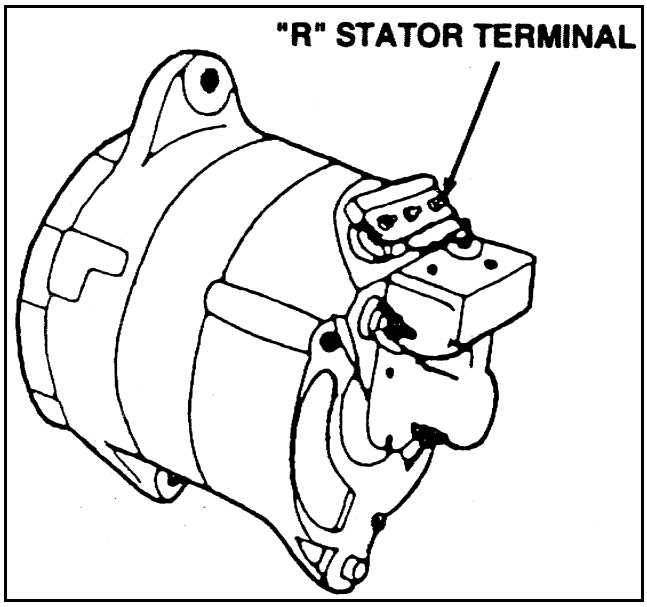
ALTERNATOR “R” STATOR TERMINAL CORROSION PROTECTION

The “R” stator terminal on alternators can become corroded which is caused by oxygen in the atmosphere combining with impurities on the surface of the exposed conductor. This corrosion can interfere with the alternator’s RPM signal which adversely affects the EOS (electronic overspeed switch) performance.

To prevent corrosion, apply a sealant to the terminal to prevent oxygen in the atmosphere from coming in contact with the conductor.

There are two main types of connections on the “R” stator terminal and each one requires a different sealant.

1. 3/8” female stud type connector – Use Dipit as a sealant.
2. Molded pin plug – Use an antioxidant grease as a sealant.



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PRESSURES and CYCLE TIMES



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FORM SF0159S
(11-09)

STD. PRESSURES AND CYCLE TIMES - ALL PRODUCTS

F 4000

MODEL	MAIN RELIEF	DUO PRESS	BLADE DETENT	SLIDE DETENT	BLADE BACK OFF RELIEF	OPTIONS RELIEF	CYCLE TIME NON REGEN @ 28 GPM	CYCLE TIME W/ REGEN @ 28 GPM
F 4000 - 13	2500 psi	1400/800 psi	2350 psi	2400 psi	2900 psi	1400 psi	22 - 26 sec	15 - 17 sec
F 4000 - 16	2500 psi	1400/800 psi	2350 psi	2400 psi	2900 psi	1400 psi	22 - 26 sec	15 - 17 sec
F 4000 - 18	2500 psi	1400/800 psi	2350 psi	2400 psi	2900 psi	1400 psi	22 - 26 sec	15 - 17 sec
F 4000 - 20	2500 psi	1400/600 psi	2350 psi	2400 psi	2900 psi	1400 psi	22 - 26 sec	15 - 17 sec
F 4000 - 25	2500 psi	1400/550 psi	2350 psi	2400 psi	2900 psi	1400 psi	22 - 26 sec	15 - 17 sec
EOS Setting	Disengage at 150rpm above throttle advance rpm							

PT 1000

MODEL	MAIN RELIEF	RESISTANCE RELIEF	BLADE DETENT	SLIDE DETENT	BLADE BACK OFF RELIEF	OPTIONS RELIEF	CYCLE TIME @28 GPM	
ALL	2750 psi	N/A	2350 psi	2500 psi	3900 psi	1400 psi	15 - 17 sec	
EOS Setting	Disengage at 150rpm above throttle advance rpm							

DP 5000

MODEL	MAIN RELIEF	LOGIC VALVE B/C	BLADE DETENT	SLIDE DETENT	BLADE BACK OFF RELIEF	OPTIONS RELIEF	CYCLE TIME - PTO DIRECT MOUNT WITHOUT DRIVE LINE @ 27 GPM	CYCLE TIME - STD FRONT MOUNT PUMP **or** PTO WITH DRIVE LINE @ 47 GPM
ALL Other	2500 psi	2100/2350 psi	2400 psi	Mechanical	3900 psi	1400 psi	*28 - 32 sec	16 - 18 sec
NYC†	2700psi	2100/2350 psi	2400 psi	Mechanical	3900 psi	n/a	*28 - 32 sec	n/a
EOS Setting	Disengage at 150rpm above throttle advance rpm							

POWER TRACK COMMERCIAL

MODEL	MAIN RELIEF	LOGIC VALVE B/C	BLADE DETENT	SLIDE DETENT OUT/IN	BLADE BACK OFF RELIEF	OPTIONS RELIEF	CYCLE TIME - PTO DIRECT MOUNT WITHOUT DRIVE LINE @ 32 GPM	CYCLE TIME - STD FRONT MOUNT PUMP **or** PTO WITH DRIVE LINE @ 35 GPM
ALL	2500 psi	2100/2350 psi	2350 psi	2400 psi/Mech.	3900 psi	1400 psi	*28 - 32 sec	21 - 23 sec
EOS Setting	Disengage at 150rpm above throttle advance rpm							

4060 (SPLIT BODY REL)

MODEL	MAIN RELIEF	LOGIC VALVE WIDE B/C ---- NARROW B/C	BLADE DETENT	SLIDE DETENT OUT/IN	BLADE BACK OFF RELIEF	OPTIONS RELIEF	PUMP UNLOAD	CYCLE TIME @ 28 GPM
NYC†	2950	1850/2050 -- 1200/1450	2350 psi	2350/Mech.	2900 psi	1400 psi	2800	15 - 17 sec
Others	2500	1850/2050 -- 1200/1450	2350 psi	2350/Mech.	2900 psi	1400 psi	n/a	15 - 17 sec
EOS Setting	Disengage at 150rpm above throttle advance rpm							

All others

MULTI PACK

MODEL	MAIN RELIEF	LOGIC VALVE	BLADE DETENT	SLIDE DETENT	BLADE BACK OFF RELIEF	OPTIONS RELIEF	CYCLE TIME @ 47 GPM	
ALL	2500 psi	N/A	2350 psi	Mechanical	3900 psi	1400 psi	16 - 18 sec	
EOS Setting	Disengage at 150rpm above throttle advance rpm							

* It is acceptable to set the cycle time between 22 - 32 seconds when certain Engine/ PTO combinations prohibit meeting the 28 second minimum.

† See specific work Instructions for adjusting NYC Units with Piston Pumps

NOTE: All p.s.i settings have a tolerance range of +/- 75 p.s.i. and are to be set at operating speed

FRONT LOADER

MODEL	MAIN RELIEF	PACKER RELIEF EXT / RET	EXTEND TOP DOOR REIEF	TAILGATE RELIEF	ARM DOWN RELIEF - 6000# ARMS	ARM DOWN RELIEF - 8000# ARMS	AUTOPACK CYCLE TIME	ARM ONLY CYCLE TIME - 6000# ARMS @ 45 GPM	ARM ONLY CYCLE TIME - 8000# ARMS @ 45 GPM'
Dump	2500	2650/1750	500	1500/1500	1750	1250	20 - 23 sec	10 - 13 sec	13 - 18 sec
Eject	2500	2650/2650	500	1500/1500	1750	1250	18 - 21 sec	10 - 13 sec	13 - 18 sec
EOS SETTINGS	Disengage the pump at 1450 rpm in neutral and reengage at 1050 rpm. (1800 in gear)								
Dump and Eject									

SIDE LOADER

F 7000 SQUARE

MODEL	MAIN RELIEF	LIFT UP/DOWN	GRAB RELIEF	REACH RELIEF IN/OUT	LIFT PRESS. SWITCH	PACKER PRESS. SWITCH	LIFT CYCLE TIME	PACKER CYCLE TIME @ 23 GPM
ALL	2500	2000/800	2000	800/800	1200	2200	7 - 9 sec	11 - 14 sec
EOS SETTINGS	Disengage P1 - at 900rpm P2 at 1800rpm							

DP 7000

MODEL	MAIN RELIEF	LIFT UP/DOWN	GRAB RELIEF	REACH RELIEF	LIFT PRESS. SWITCH	PACKER PRESS. SWITCH	LIFT CYCLE TIME	PACKER CYCLE TIME @ 44 GPM
Dump	2500	2000/800	2000	800/800	1200	2200	7 - 9 sec	12-16 sec
Eject	2500	2000/800	2000	800/800	1200	2200	7 - 9 sec	12-17 sec
			Hugger = 1100		Hugger = 800			
EOS SETTINGS	Disengage P1 - at 900rpm P2 at 1800rpm							

DP PYTHON

MODEL	MAIN RELIEF	LIFT UP/DOWN	GRABBER RELIEF	REACH RELIEF IN/OUT		PACKER PRESS. SWITCH	LIFT CYCLE TIME	PACKER CYCLE TIME @ 44 GPM
Dump	2500	2300/1250	1250/1250	2300/1250		2200	6 - 8 sec	12 -14 @1200 rpm
Eject	2500	2300/1250	1250/1250	2300/1250		2200	6 - 8 sec	12 -14 @1200 rpm
EOS SETTINGS	Joystick Disengage at 900 rpm - Pump Disengage at 1800 rpm							

CP PYTHON

MODEL	MAIN RELIEF	LIFT UP/DOWN	GRABBER RELIEF	REACH RELIEF IN/OUT	BODY MAIN RELIEF	PACKER PRESS. SWITCH	LIFT CYCLE TIME	PACKER CYCLE TIME @ 16 GPM 180 deg sweep
ALL	2500	2300/1250	1250/1250	2300/1250	2400	2200	6 - 8 sec	13 -16 sec
EOS SETTINGS	Disengage P1 - at 900rpm P2 at 1800rpm							

FORMULA PYTHON

MODEL	MAIN RELIEF	LIFT UP/DOWN	GRABBER RELIEF	REACH RELIEF IN/OUT	BODY MAIN RELIEF	PACKER PRESS. SWITCH	LIFT CYCLE TIME	PACKER CYCLE TIME @ 23 GPM
ALL	2500	2300/1250	1250/1250	2300/1250	2500	2200	6 - 8 sec	11 - 14 sec
EOS SETTINGS	Disengage at 1500 rpm							

STARR PYTHON

MODEL	MAIN RELIEF	LIFT UP/DOWN	GRABBER RELIEF	REACH RELIEF IN/OUT	BODY MAIN RELIEF	PACKER PRESS. SWITCH	LIFT CYCLE TIME	PACKER CYCLE TIME @ 16 GPM 180 deg sweep	SELECTOR VALVE RELIEF (SPLIT RR)
ALL	2500	2300/1250	1250/1250	2300/1250	2400	2200	6 - 8 sec	13 -16 sec	3000
EOS SETTINGS	Disengage P1 - at 900rpm P2 at 1800rpm								

RAPID RAIL/ STARR

MODEL	LOADER MAIN RELIEF	RELEASE RELIEF	IN RELIEF	BODY MAIN RELIEF	GRABBER PRESS. SWITCH	PACKER PRESS. SWITCH	LIFT CYCLE TIME	PACKER CYCLE TIME @ 16 GPM 180 deg sweep	SELECTOR VALVE RELIEF (SPLIT RR)
RAPID RAIL	2200	1100	1700	2400	2000	2200	7 - 9 sec	13 -16 sec	3000
STARR	2200	1100	1700	2400	2000	2200	7 - 9 sec	13 -16 sec	3000
EOS SETTINGS	Disengage P1 - at 900rpm P2 at 1800rpm								

NOTE: All p.s.i settings have a tolerance range of +/- 75 p.s.i. and are to be set at operating speed

MULTITASK III														
MODEL	MAIN INLET RELIEF	LIFT UP	LIFT DOWN	GRABBER EXTEND	GRABBER RETRACT	REACH IN	REACH OUT	TIPPERS UP	TIPPERS DOWN	MID-INLET MAIN RELIEF	CRUSHER RELIEF	PACKER PRESS. SWITCH	LIFT CYCLE TIME/TIPPER CYCLE TIME	PACKER CYCLE TIME
UNIT W/TELEGRIP ARM	2700	2500	1500	1500	1500	2500	2500	N/A	N/A	2500	1500	2200	9-11 sec.	12-14 sec
UNIT W/TIPPERS	2700	N/A	N/A	N/A	N/A	N/A	N/A	1500	1500	2500	1500	2200	7 - 8 sec	12-14 sec
EOS Setting	Disengage P1 - at 900rpm P2 at 1800rpm													
RETRIEVER														
MODEL	MAIN RELIEF	EJECTOR			EXTEND DETENT	RETRACT DETENT		CART DUMPER RELIEF						PACKER CYCLE TIME @ 13 GPM
RT - 6	2400	2500			1500	1800		1400						16 - 18 sec
RT - 10	2400	2500			1500	1800		1400						16 - 18 sec
EOS Setting	Disengage at 150rpm above throttle advance rpm													
R 2000														
MODEL	MAIN RELIEF	PACKER PRESS. SWITCH											BUCKET CYCLE TIME	PACKER CYCLE TIME @ 23 GPM
33 YD	1800	1600											11-13 sec	17-19 sec
38 YD	2000	1800												
EOS Setting	Disengage 1450rpm or 150rpm above throttle advance rpm													
POWERLIFT														
MODEL	MAIN RELIEF	TOP DOOR			PACKER								LIFT CYCLE TIME	PACKER CYCLE
	3000	500			2500								7 - 9 sec	20 - 24 @
EOS Setting	Disengage P1 - at 1900rpm P2 at 900rpm													
NOTE: All p.s.i settings have a tolerance range of +/- 50 p.s.i. and are to be set at operating speed														

All Units



SERVICE MANUAL

SECTION 3
PUMPS

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SMS3-SWS-706213-0909

Customer Support

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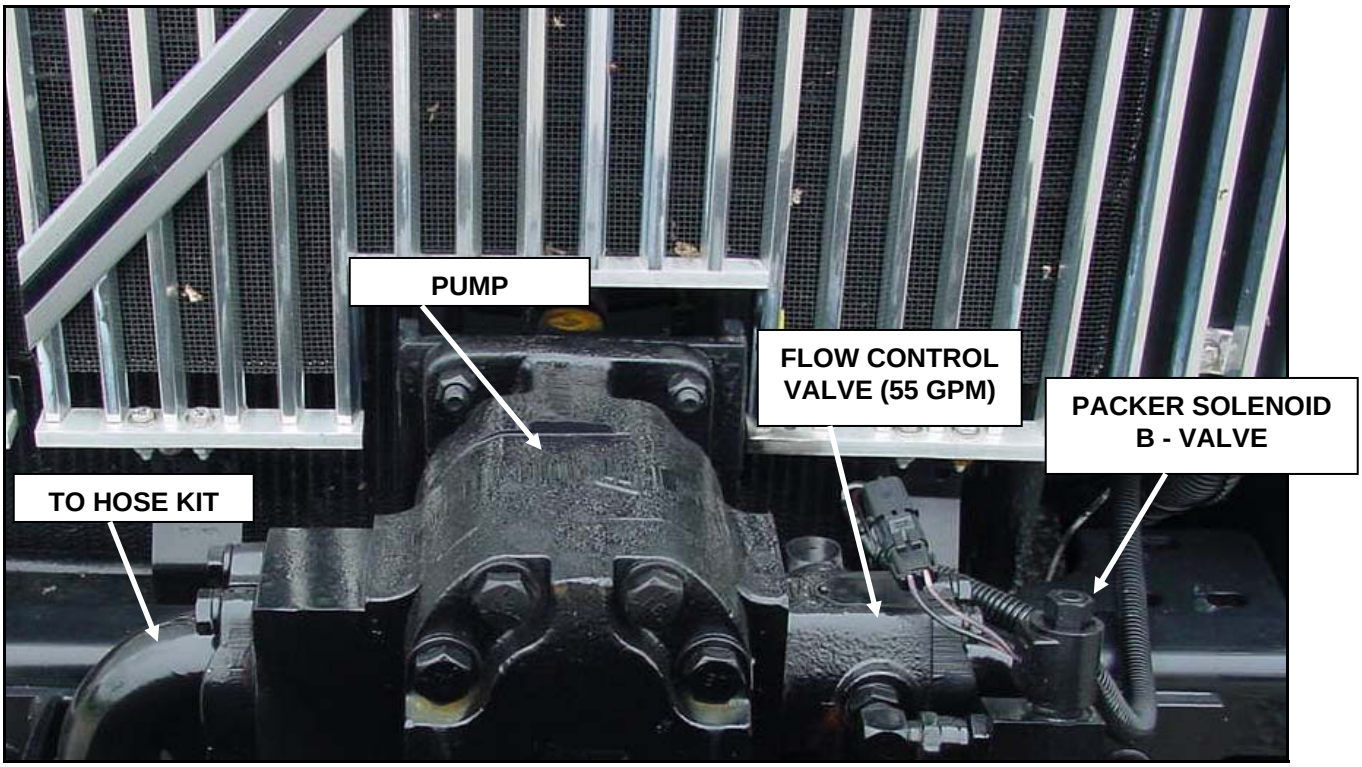
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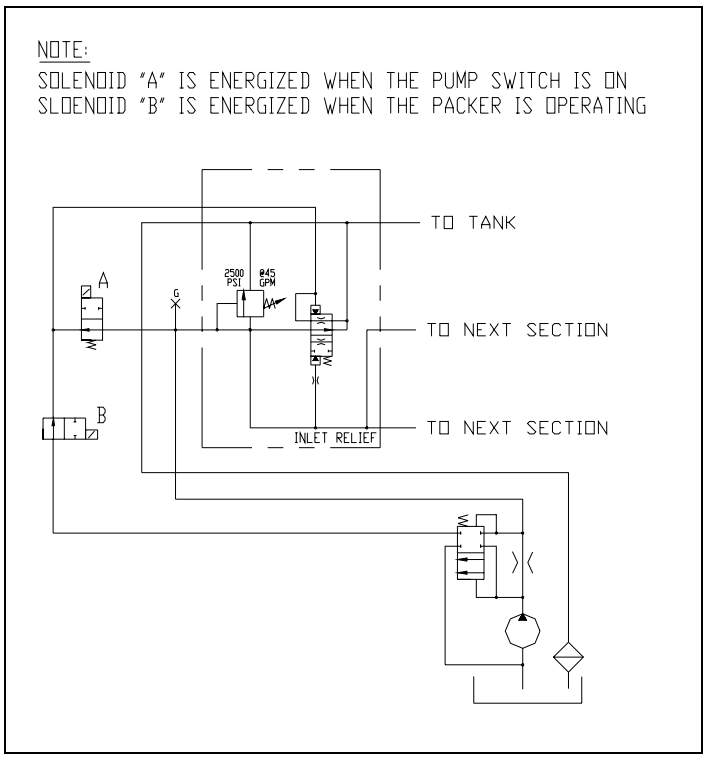
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COMMERCIAL FRONT MOUNT (HOC) FOR PYTHON – USED ON EARLIER MODELS





The HOC system is designed to unload the hydraulic system when the pump flow exceeds 55 GPM.

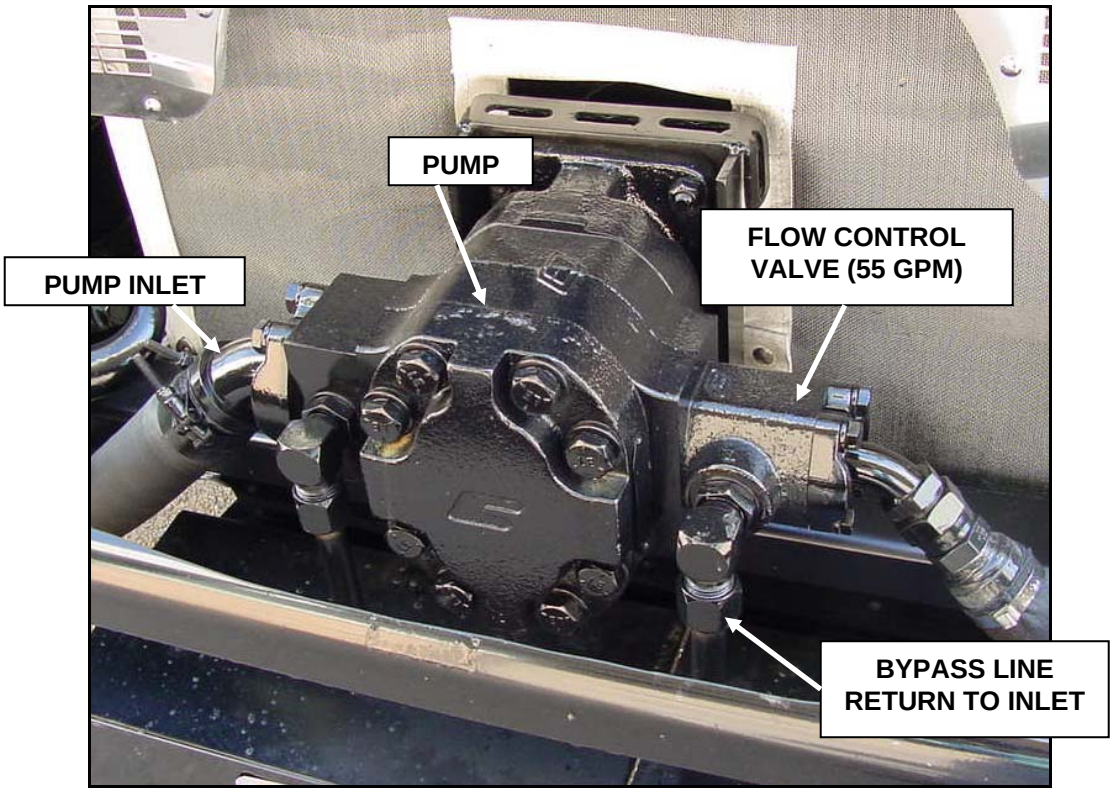
Hydraulic system unloading occurs when the pressure drop across the flow control orifice reaches 50 PSI.

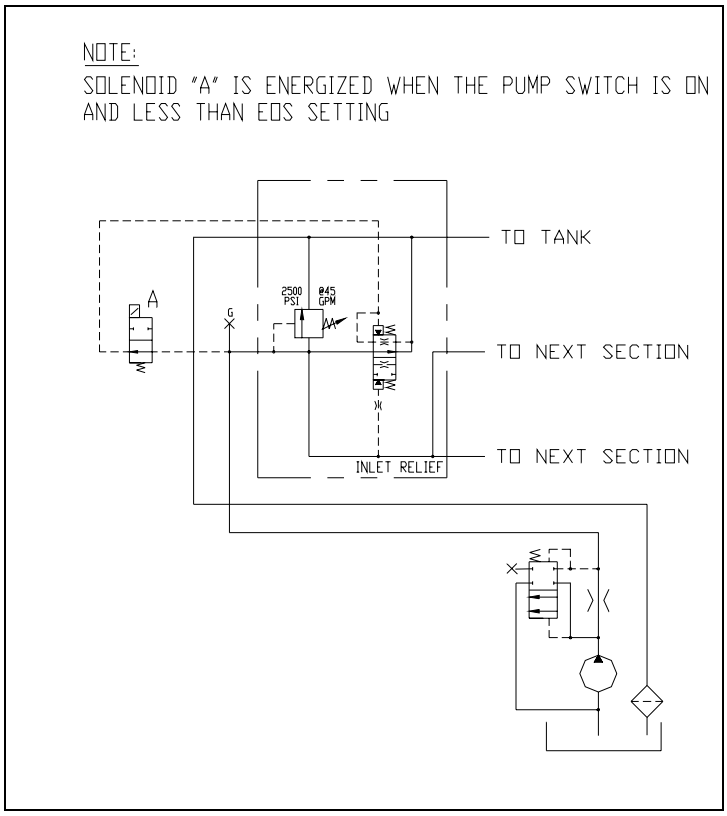
To restore power to the hydraulic system, the operator must lower the engine speed 300 to 400 RPM below the HOC speed setting.

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PYTHON COMMERCIAL FRONT MOUNT (HOC) – LATER UNITS





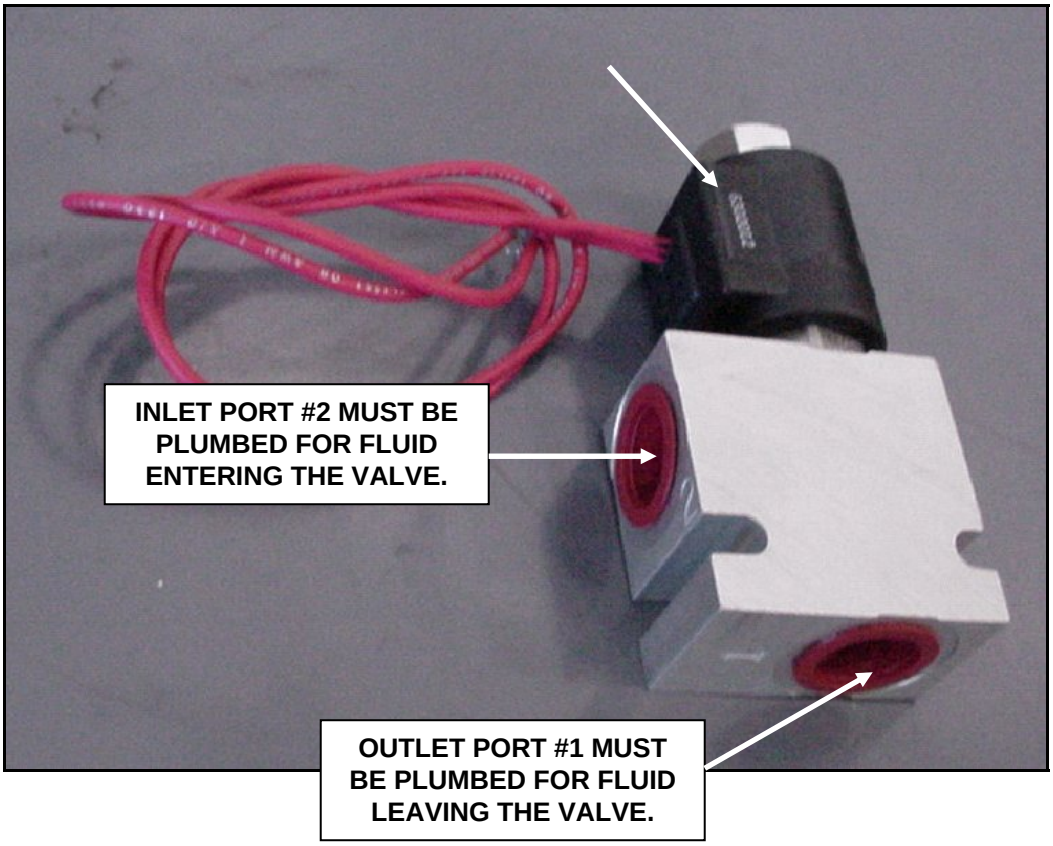
The HOC system is designed to unload the hydraulic system when the pump flow exceeds 55 GPM.

Solenoid A is located on the lift control valve. See Section 2 – Lift Service Manual for more information.

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PUMP SHUT-OFF VALVE – USED WITH COMMERCIAL HOC SYSTEM



This pump shut-off valve style normally opens and closes when the coil is activated. The valve does not have a plumbing schematic but must be plumbed one way to function properly. Fluid must enter port #2 and exit port #1.

Caution: Failure to plumb the pump shut off valve in this manner may cause system malfunction or “system chatter”.

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FLOW CONTROL VALVE TESTING FOR HOC PUMP

Follow these steps to test the flow control valve.

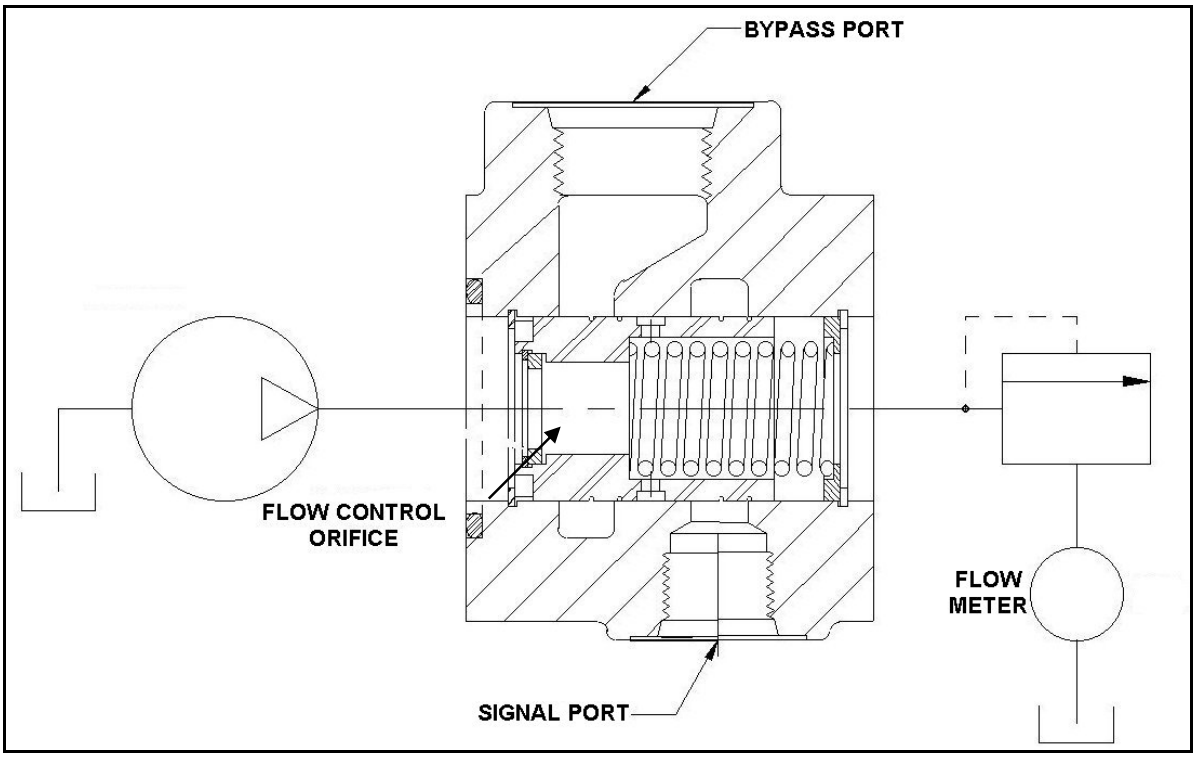
BYPASS AND BINDING TEST

1. Warm hydraulic system temperature to 120°F.
2. Increase oil flow through the flow control valve until you reach 55 GPM.
3. When the oil starts flowing from the bypass port, record the flow going through the valve. The oil should bypass at +/- 3 GPM of the 55 GPM flow.
4. Cycle two or three more times to be sure valve spool moves freely and does not bind.
5. If the valve exceeds 55 GPM, check for the correct orifice in the spool.

FLOW CONTROL LEAKAGE TEST

Check valve spool leakage by running 50 GPM (5 less than the actual flow of 55 GPM) through the valve with 1100 PSI on the flow control valve outlet. The flow control leakage should not exceed 1000 CC/minute (about 1/4 GPM) from the valve signal port.

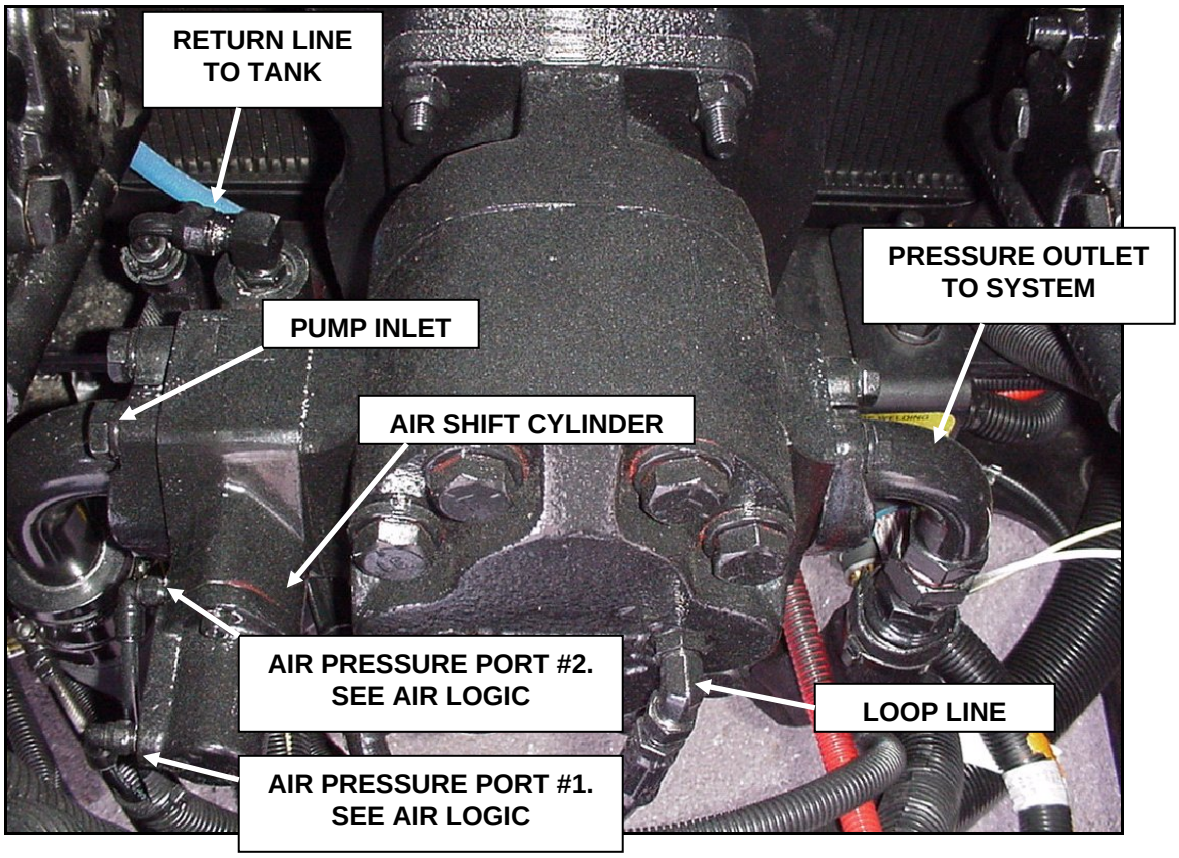
Orifice Part No.	GPM
031-5776-001	55 – 60
031-5776-002	50 – 54
031-5776-003	45 – 49
031-5776-004	40 – 44
031-5776-005	35
031-5776-006	20

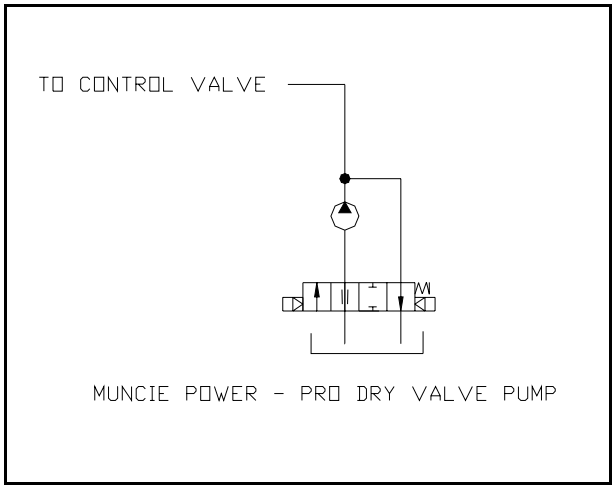


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SINGLE GEAR PUMP WITH POWER PRO DRIVE VALVE (MUNCIE)





This pump set up does not require a constant flow valve in the OFF mode. The power pro dry valve system allows pump cooling and lubrication through the loop line and back to the tank when the system is in the off mode. In the ON mode the loop line is closed to tank and all fluid is sent to system pressure.

AIR LOGIC

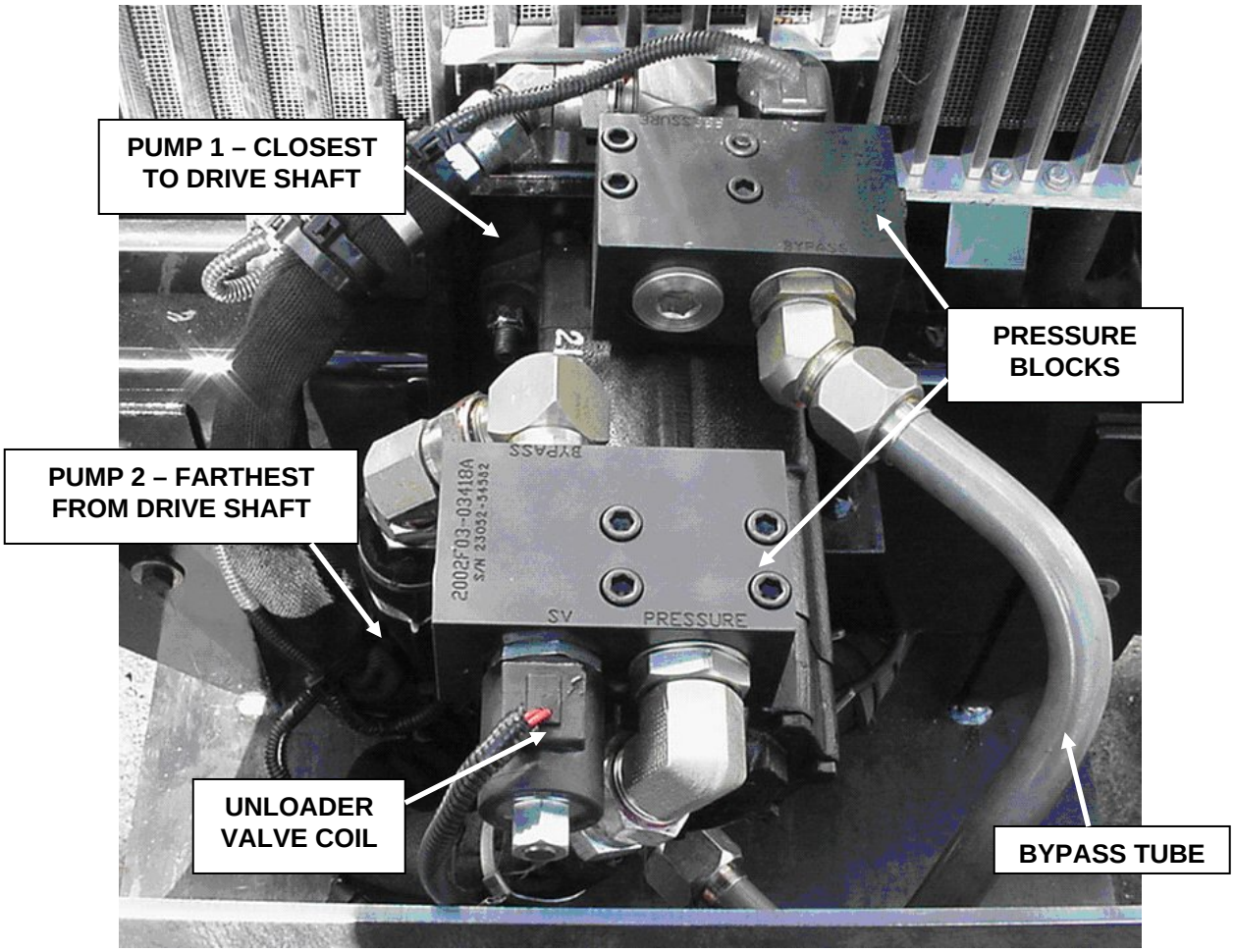
Pump On – Apply air pressure to port #1 and release air pressure from port #2.

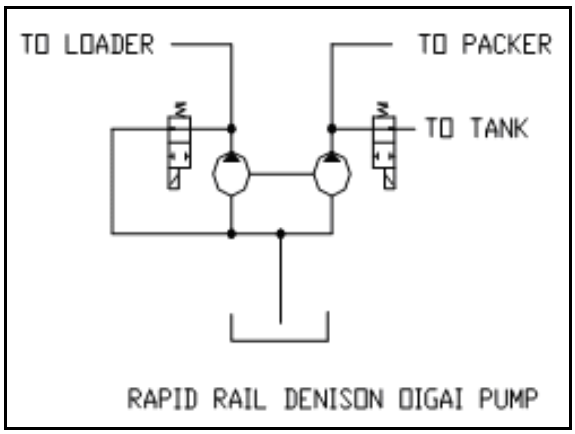
Pump Off – Release air pressure from port #1 and apply air pressure to port #2.

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TANDEM O.I.G.A.I. PUMP – FRONT LOADERS, REAR LOADERS, RECYCLE 2000, CP PYTHONS





This is the Hydraulic Controls Operate-In-Gear-At-Idle (OIGAI) system. The pump section (pump 1) closest to the input shaft operates the lift and shuts off first. The pump section (pump2) farthest from the input shaft operates the packer and stays on at higher RPMs.

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All Units

REAR LOADER OAI OPERATION FOR PROGRAM 109-0205

The rear loader Operate-at-Idle (OAI) fast cycle pump system uses a tandem vane pump with a P1 front section (closest to input shaft) and a P2 back section (farthest from input shaft). The PLC program, electrical wiring, electronic pressure switch adjustment, and hydraulic plumbing are all critical and must be exact for this system to function properly.

PowerTrak Commercial and PowerTrak 1000 - P1 front section uses a 42 GPM cam ring; P2 back section uses a 35 GPM cam ring; Packer cycle time 15-17 seconds.

This hydraulic system produces the most flow and has the fastest cycle times at engine idle speed. The system is designed to operate all hydraulic functions at idle. The throttle advance switches on the body do not cause the engine RPMs to increase but calls for more flow by turning on P1. This system also allows for pack-on-the-run.

PLC PROGRAM 109-0205

- Uses input 0.04 to monitor the ON / OFF status of the throttle advance switches. This input should be ON when either of the throttle advance switches on the body are activated.
- Uses input 0.05 to monitor the ON / OFF status of the electronic pressure switch. The input should be OFF during low pressure and ON when the hydraulic system reaches the high pressure setting of the electronic pressure switch.
- Uses output 10.01 for P1 (pump closest to input shaft) to turn ON when the body throttle advance switch is activated and to shut OFF when above 1000 RPM or when the high pressure setting of the pressure switch is reached.
- Uses output 10.03 for P2 (pump farthest from input shaft) to turn ON when the pump switch is activated and to shut OFF when above 2000 RPM.

ELECTRONIC PRESSURE SWITCH

This switch is used to prevent the engine from stalling when using the front loader body functions during engine idle. Some engines do not produce enough net torque at idle and will stall while using some of the hydraulics functions.

The pressure switch is used to shut off the P2 (pump farthest from input shaft) just before the engine stalls. This setting (SP1) is generally around 2000 psi but can be customized to accommodate the particular engine characteristics for each individual machine.

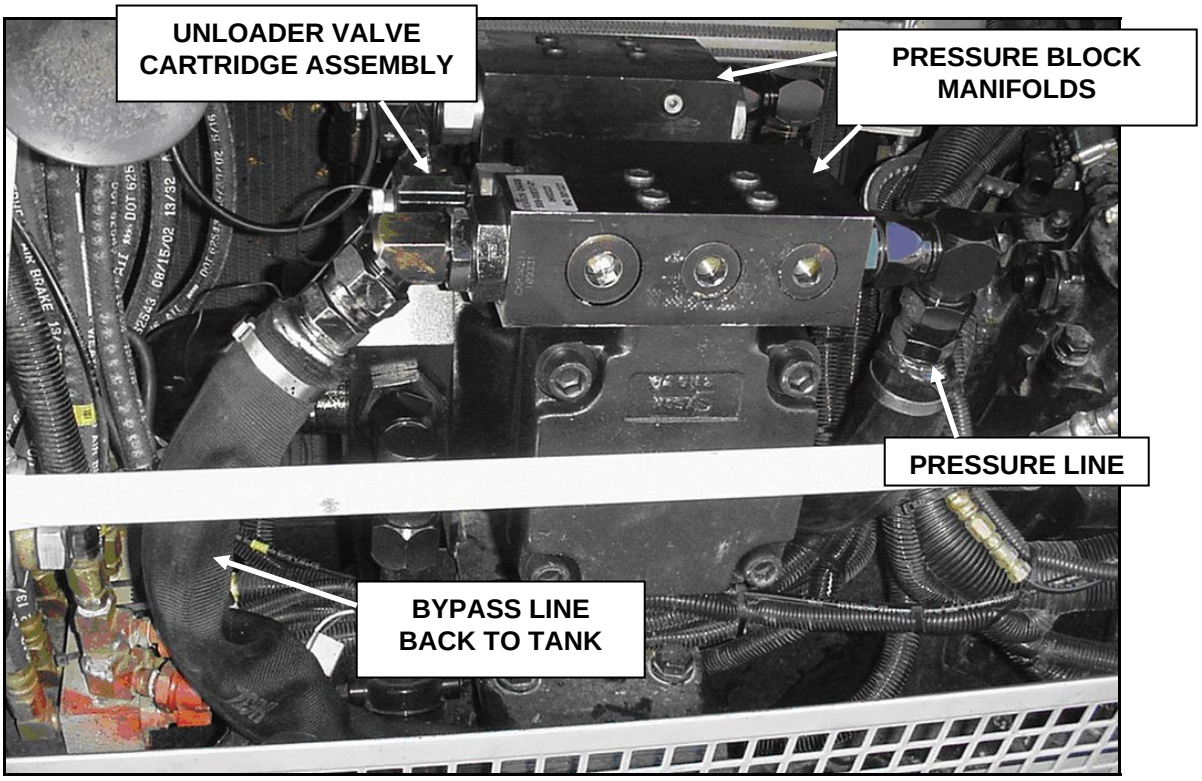
The re-engage pressure is set at 1300 psi. This is the pressure that tells the pump to turn ON again. For example, if the pump shuts OFF at 2000 psi and turns back ON at 1300 psi, the re-engage setting is 700 psi. A re-engage setting that is too low may cause hydraulic system chatter.

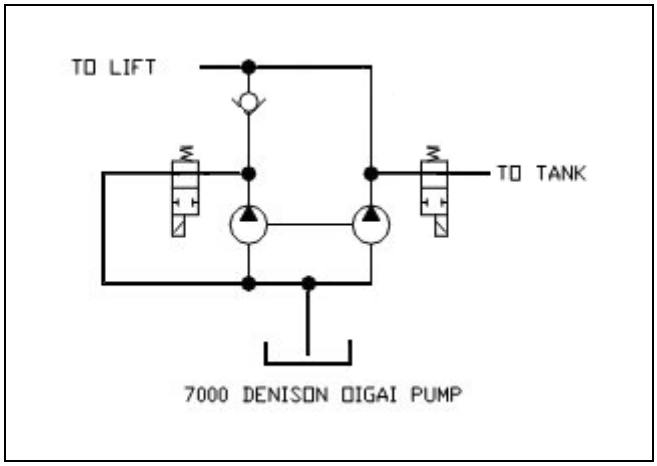
The electronic pressure switch must be plumbed into the main pressure circuit at the hydraulic pump pressure block to work properly. Shut OFF the smaller P2 at idle to prevent engine stall. A pressure switch that is plumbed or wired incorrectly can cause hydraulic system chatter.

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TANDEM VANE PUMP WITH MONOBLOCK CONTROL MANIFOLDS – NON-O.I.G.A.I. COMBINED FLOW – DP7000 AUTO SIDE LOADER, F4000 O.I.G.A.I., PT1000 O.I.G.A.I.





This pump uses three manifolds to direct the flow of oil away from the pump to the system pressure circuit.

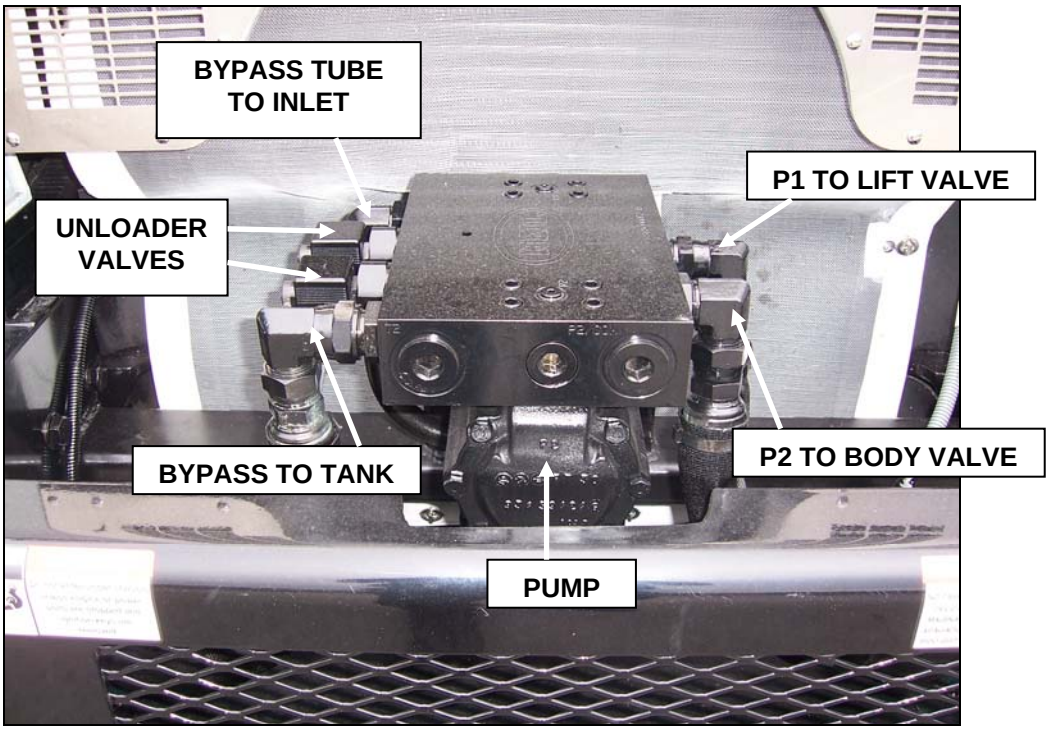
The two pressure block manifolds each contain an unloader valve cartridge and coil assembly to activate the system and an internal one-way check valve for each pump circuit.

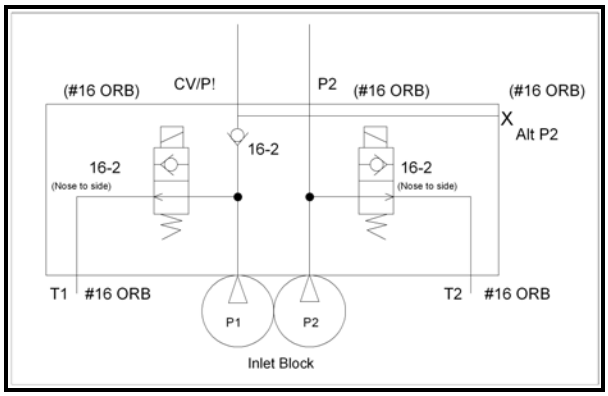
The pump closest to the input shaft shuts OFF first at lower RPMs while the pump farthest from the input shaft stays ON at higher RPMs.

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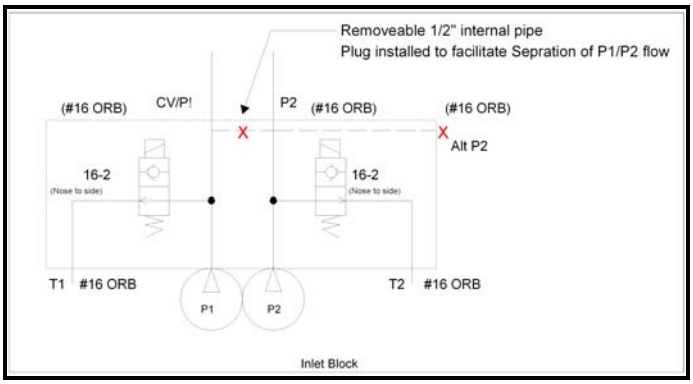
TANDEM VANE PUMP WITH MONOBLOCK SEPARATE OUTLET FLOW – RAPID RAIL AND PYTHON AUTO SIDE LOADER





Combined Flow

In the monoblock Operate-in-Gear-at-Idle hydraulic system. The pump section (pump 1) closest to the input shaft operates the lift and shuts OFF first. The pump section (pump 2) farthest from the input operates the packer and stays ON at higher RPMs.

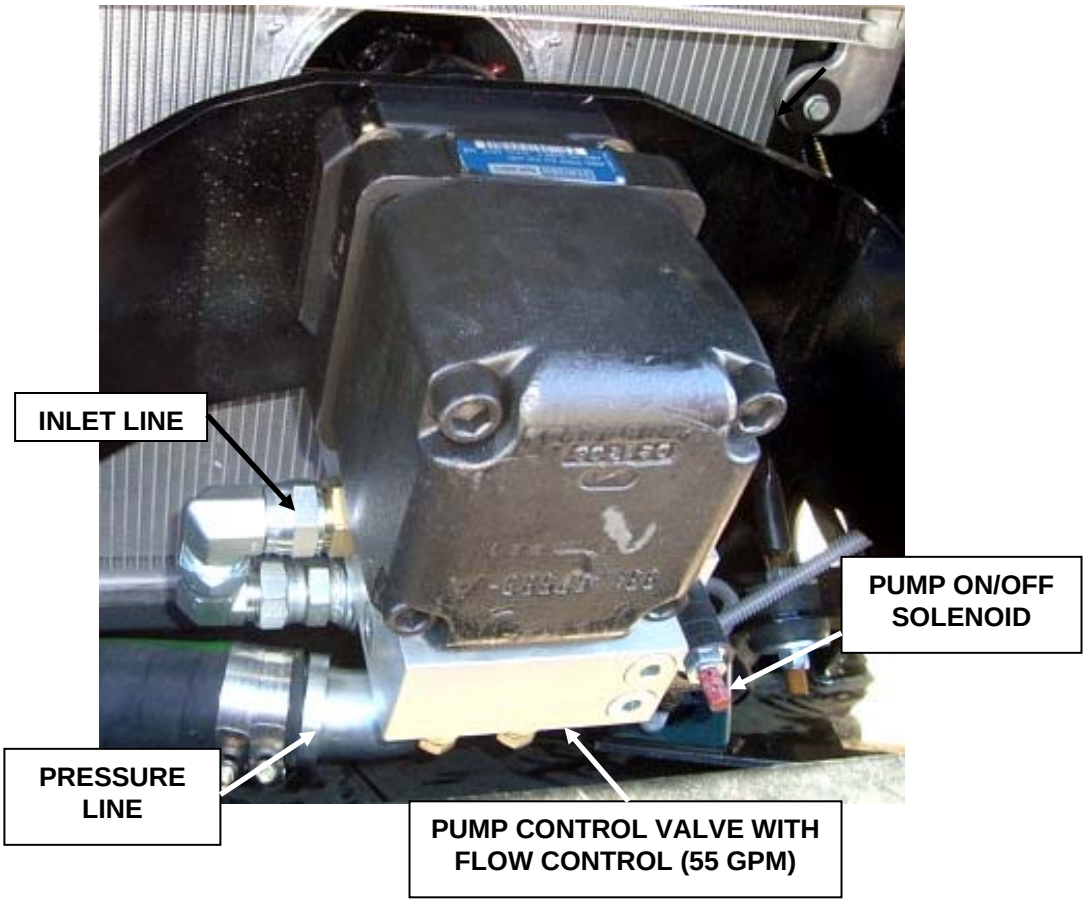


Isolated Flow

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SINGLE VANE PUMP WITH CONTROL MANIFOLD – FRONT END LOADERS AND PRE-2009 DP PYTHONS



The single vane pump control valve is designed to limit the flow to 55 GPM. Excess flow is re-circulated to the inlet.

The pump ON/OFF valve must have power to turn the pump ON.

When the pump solenoid is in the OFF mode, oil is allowed to circulate back to the inlet.

The maximum pump speed is controlled by the PLC.

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SINGLE PUMP REPAIR PROCEDURES

Heil has migrated many products to a high pressure vane pump. Although ratings vary, these pumps are generally rated for higher pressure and higher duty cycles than similar size gear pumps. Because of the design of a vane pump, it is generally not necessary to replace the entire pump. The pump cartridge contains all of the wear items in a vane pump. Replacing the cartridge provides the same performance as replacing the entire pump.

Use the following procedures to field repair and inspect a Heil single vane pump. The procedure was performed on an Autocar chassis and can be used on other chassis. These instructions show complete tear down of the pump assembly. They can be used to replace a failed pump cartridge or failed pump shut-off valve.

Before making adjustments, make sure the unit is in the LOCK-OUT position. LOCK-OUT position is defined as follows:

1. Engine stopped and ignition key removed.
2. Set the brakes and make sure they are holding.
3. Chock all wheels.
4. Insert a LOCK-OUT tag on the steering wheel.



Tools Required

Tools needed to replace the pump include the following:

- 1 1/2 inch open end boxed end wrench
- 3/4 inch open end boxed end wrench
- Wire cutters (Dikes)
- 1/2 inch drive ratchet
- 14mm 1/2 inch drive hex head socket
- 3/8 inch hex head wrench
- 5/32 inch hex head wrench
- Torque wrench capable of producing 150 ft lbs.
- NOTE: Test the cartridge for damage by flow testing the pump before disassembly.

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1. Remove the zip tie from the oil shut-off valve on the hydraulic oil tank. (Figure 1)



Figure 1 Cut zip tie

2. Turn the shut-off valve to the OFF position. (Figure 2).



Figure 2 Turn off shut-off valve

3. Remove the grill from the chassis. (Figure 3)
The number of bolts for the grill varies with chassis brand.



Figure 3 Remove grill

4. Cut the zip tie around the electrical wiring that controls the pump shut-off valve solenoid. (Figure 4)

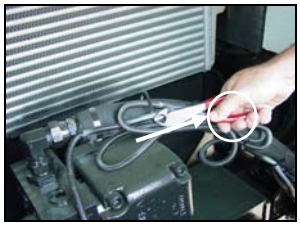


Figure 4 Cut zip tie around wiring

5. Disconnect the electrical wiring—the two-way Packard plug—that controls the pump shut-off valve solenoid. (Figure 5)



Figure 5 Disconnect wiring

6. Remove the one-inch hydraulic pressure hose. (Figure 6)



Figure 6 Remove hydraulic pressure hose

7. Remove the four suction line flange bolts. (Figure 7)



Figure 7 Remove flange bolts

8. Remove the eight bolts connecting the pump shut-off valve to the pump. (Figure 8) There are four small bolts and four large bolts.

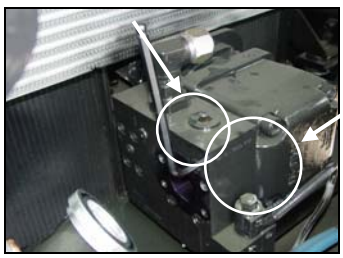


Figure 8 Remove bolts from shut-off valve

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9. Carefully, remove the shut-off valve from the pump. (Figure 9)



Figure 9 Remove shut-off valve

10. Remove the four pump housing connecting bolts. (Figure 10)



Figure 10 Remove housing connecting bolts

11. Carefully remove the pump case housing. (Figure 11)



Figure 11 Remove housing

12. Remove the pump cartridge by pulling it toward you. (Figure 12) The fit may be tight.



Figure 12 Remove pump cartridge

13. Inspect the pump shaft, spines, and bearings for wear and damage. (Figures 13 and 14) Check for the following:
 - Sheared or worn shaft splines.
 - Broken bearing



Figure 13 Inspect parts



Figure 14 Inspect parts

14. Inspect the brass bushing on the pump cartridge for wear and damage. (Figure 15)

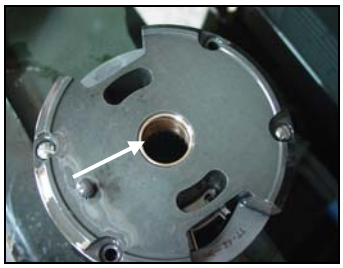


Figure 15 Inspect brass bushing

15. Check the outer housing O-ring for wear or damage such as nicks, fraying, or cuts. (Figure 16) Replace the o-ring if it is damaged.

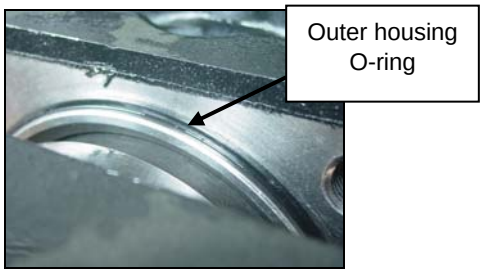


Figure 16 Check O-ring

16. Place the pump cartridge back on the pump shaft. (Figure 17)



Figure 17 install pump cartridge

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17. Replace the outer pump housing and finger-tighten the four pump housing bolts. (Figure 18)



Figure 18 Replace outer housing and bolts

18. Tighten the four outer housing bolts to 138 ft lbs. (Figure 19)



Figure 19 Torque housing bolts to 138 ft lbs

19. Install the new pump shut-off valve using the new bolts included with the new valve. (Figure 20)



Figure 20 Install new shut-off valve

20. Tighten the eight pump shut-off valve bolts as follows: (Figure 21)
 - Four small back bolts – 60 ft lb
 - Four large front bolts – 92 ft lb



Figure 21 Torque shut-off valves

21. Install the suction line flange to the pump shut-off valve and tighten the four bolts on the flange. (Figure 22)

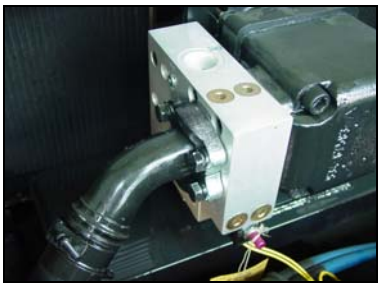


Figure 22 Replace suction line

22. Install one straight connector, 054-3341-10, to the **P Port** on the shut-off valve. (Figure 23)

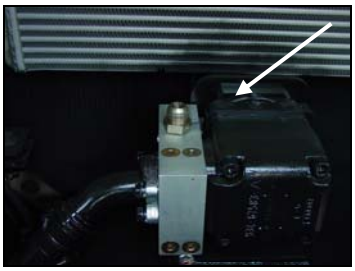


Figure 23 Install straight connector

23. Install one 90 degree elbow, 054-2988-10, on the straight connector. (Figure 24)

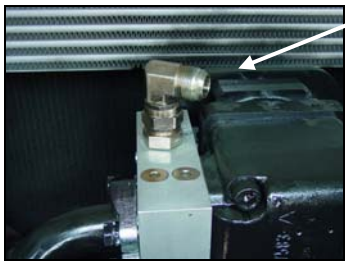


Figure 24 Install 90 degree elbow

24. Connect the one inch hydraulic pressure hose to the 90 degree elbow. (Figure 25)

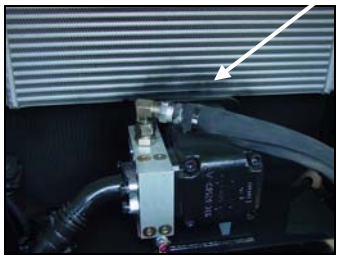


Figure 25 Reconnect hydraulic pressure hose

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25. Install the following two-way Packard connector to the two wires coming from the solenoid on the new shut-off valve: (Figure 26)
 - 1 ea – 108-4827-004 Two-way female connection
 - 2 ea – 108-4827-120Female terminal (18-20AWG)
 - 2 ea – 108-4827-132 Cable seal (16-14 GA)

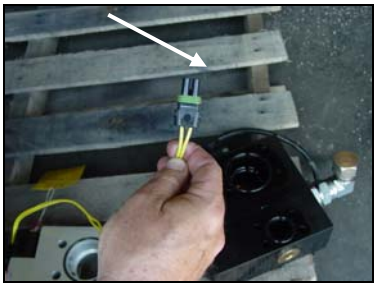


Figure 26 Install two-way Packard connector

26. Connect the new Packard connector to the original, matching Packard connector. Secure the excess wiring harness for the solenoid to the hydraulic pressure line with a zip tie. (Figure 27)



Figure 27 Connect plugs and secure excess wiring

27. Attach the grill to the chassis. (Figure 28)



Figure 28 Reattach grill

28. On the hydraulic oil pump, move the shut-off valve to the OPEN position and secure the valve with a zip tie. (Figure 29 and 30)



Figure 29 Open valve



Figure 30 Secure valve

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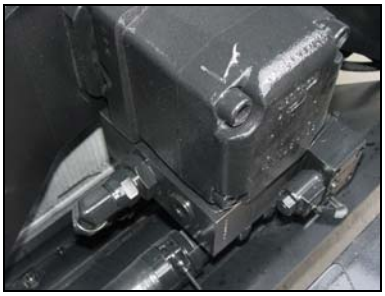
The following pictures show the 219-2303 pump configuration installed on a another chassis.











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TROUBLESHOOT PUMP 219-2303 WITH 031-6427

In 2007, Heil changed the pump control valve to a design that easily allows testing the pump and the pump control valve functions on the vehicle.

1. Hydraulic functions do not operate.
 - When pump should be on, verify there is at least 10 volts at the pump coil.
 - If 10 or more volts are present proceed to step 2.
 - If not, determine if the PLC program (if so equipped) is at fault or a wire is broken.
2. When pump should be on, pull red knurled knob on the end of the solenoid valve. (Figure 1)
 - Does the system work now?
 - If so replace the coil
 - If not proceed to step 3

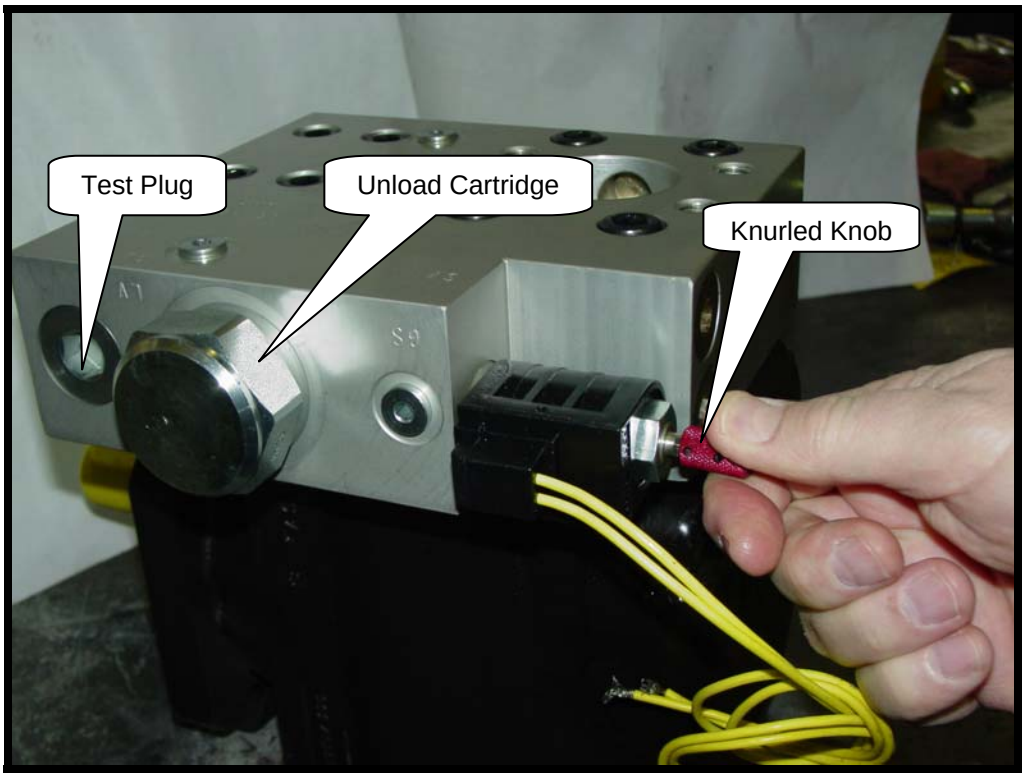


Figure 1

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3. Remove the unloading cartridge. (Figure 2) Temporarily set aside in a clean location.



Figure 2

4. Remove test plug located in the side of the pump control valve. (Figure 1)
5. Insert pug in the port where the unload cartridge was removed. There is a thread for it at the bottom of the cavity. (Figure 3)

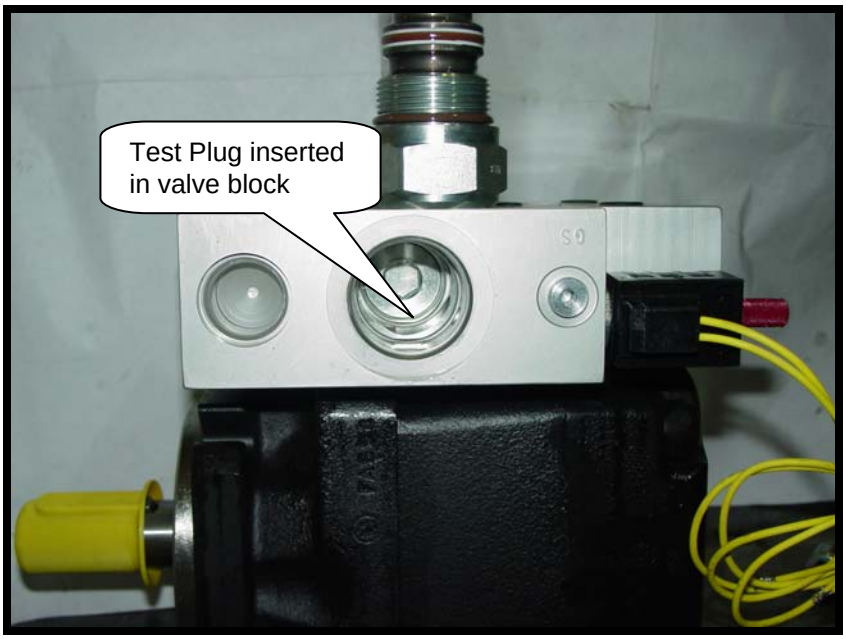


Figure 3

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6. Reinsert the unload cartridge. (Figure 4)

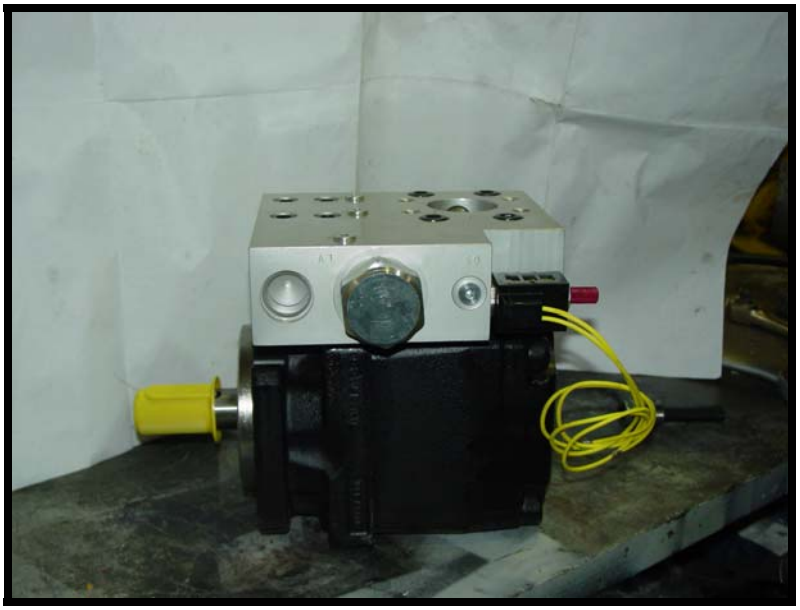


Figure 4

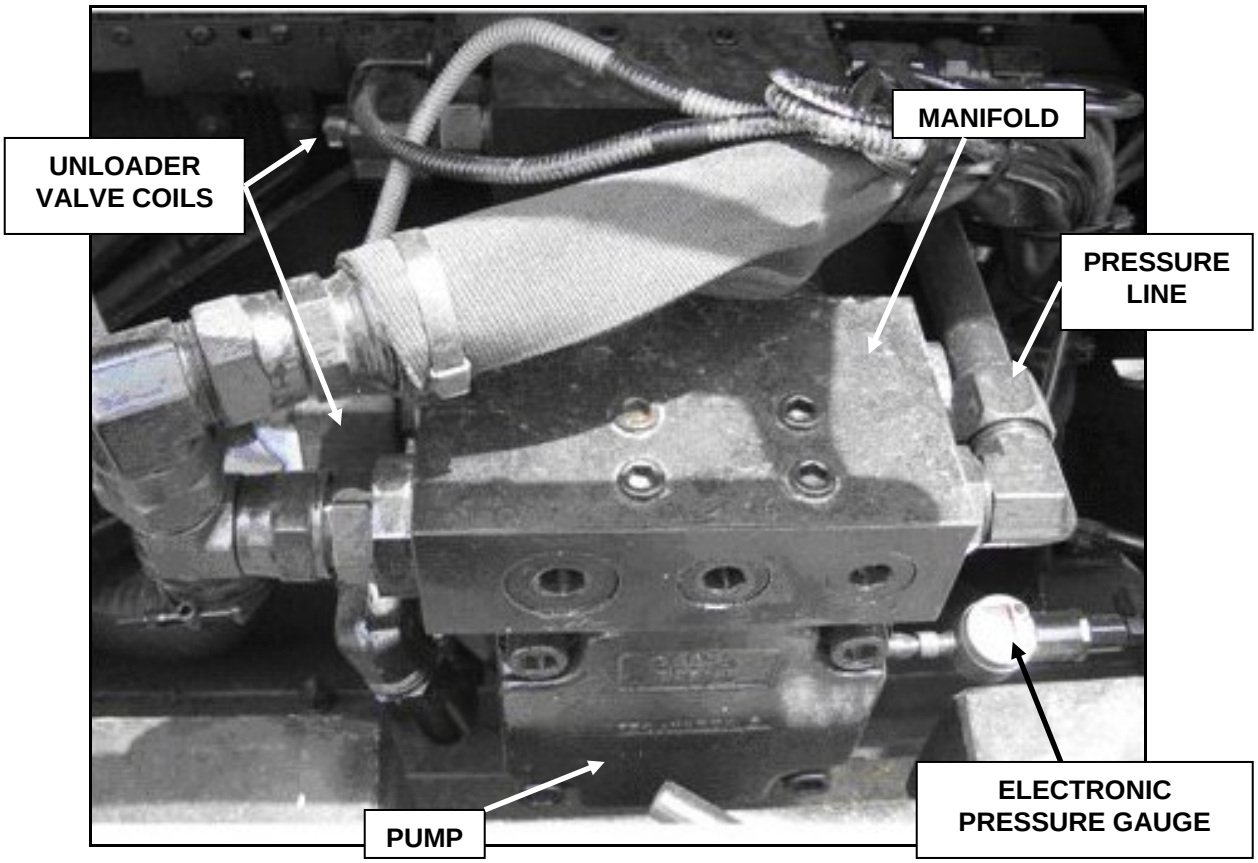
7. Start the truck and test all functions.
 - If the system now works correctly the problem is in the pump control valve.
 - If the system still does not function correctly the pump cartridge need to be replaced.
8. Remove the unload cartridge. Temporarily set aside in a clean location.
9. Remove the test plug and replace it in the side of the pump control valve.
10. Reinstall the unload cartridge.

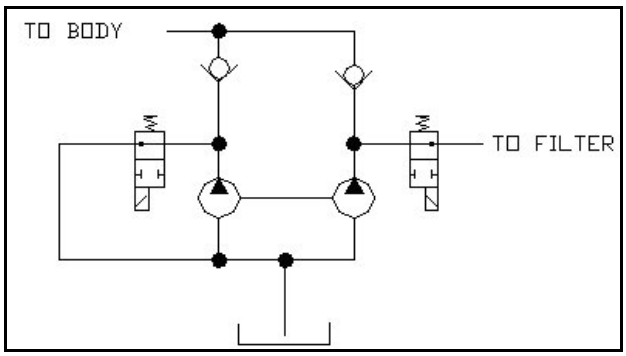
WARNING: Always remove the test plug before running the truck on routes to prevent hydraulic system failure.

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TANDEM VANE PUMP FRONT LOADER O.A.I. OPERATION – PROGRAM 109-0229





The tandem pump with the pressure manifolds combines the flow of oil from both pumping sections to get normal cycle times for the packer and body functions at engine idle.

The pumping section closest to the pump input shaft (P1) shuts OFF first during higher RPMs. The pumping section farthest from the pump input shaft (P2) stays ON longer during higher engine RPMs. The packer cycle time for units using this pump is fastest during engine idle up to 1050 RPM.

The separate pressure block manifolds contain two unloader valve and coil assemblies used to activate each respective pumping section and control the flow of oil directed to the hydraulic system.

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FRONT LOADER O.A.I. PUMP OPERATION FOR PROGRAM 109-0229

The front loader Operate-at-Idle (OAI) pump system uses a tandem vane pump with a large ring in the P1 front section (closest to input shaft) and a smaller P2 back section (farthest from input shaft). The PLC program, electronic pressure switch, electrical wiring, and hydraulic plumbing are all critical and must be exact for this system to function properly.

This hydraulic system produces the most flow and has the fastest cycle times at idle up to 1050 RPM. The system is designed to operate all hydraulic functions at idle.

PLC PROGRAM 109-0229

- Uses input 01.02 to monitor the ON / OFF status of the electronic pressure switch. The input should be ON during low pressure and shut OFF when the hydraulic system reaches the high pressure setting on the electronic pressure switch.
- Uses output 10.05 for PI (50 GPM pump closest to input shaft) to shut OFF at 1050 RPM.
- Uses output 11.06 for P2 (38 GPM pump farthest from input shaft) to shut OFF at 2100 RPM or when the high pressure setting of the pressure switch is reached.

ELECTRONIC PRESSURE SWITCH

This switch is used to prevent the engine from stalling when using the front loader body functions during engine idle. Some engines do not produce enough net torque at idle and will stall while using some of the hydraulics functions.

The pressure switch is used to shut off the P2 (pump farthest from input shaft) just before the engine stalls. This setting (SP1) is generally around 2000 psi but can be customized to accommodate the particular engine characteristics for each individual machine.

The re-engage pressure is set at 1300 psi. This is the pressure that tells the pump to turn ON again. For example, if the pump shuts OFF at 2000 psi and turns back ON at 1300 psi, the re-engage setting is 700 psi. A re-engage setting that is too low may cause hydraulic system chatter.

The electronic pressure switch must be plumbed into the main pressure circuit at the hydraulic pump pressure block to work properly. Shut OFF the smaller P2 at idle to prevent engine stall. A pressure switch that is plumbed or wired incorrectly can cause hydraulic system chatter.

NOTE: This document covers 109-0229 as of August 1, 2007.

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TANDEM VANE PUMP O.I.G.A.I. HYDRAULIC SYSTEM TROUBLESHOOTING

The Operate-in-Gear-at-Idle (OIGAI) system is designed to perform the side loading operations at standard idle speed. It is comprised of two major components, the monoblock tandem vane pump and attached unloader valve assembly.

On Rapid Rail systems the P1 or front section (closest to the pump input shaft) operates the loader section of the truck while the P2 or rear section (farthest from the input shaft) operates the body section, which includes the packer. On F7000 series units the flows from both pump sections are combined to run the lift (loader) then exit the lift valve to operate the body valve. On the Python, P1 goes to the lift and P2 combines after the lift valve to run the body.

The unloader valve assemblies consist of a manifold (pressure) block, a normally open (N.O. or NO) cartridge valve and a 12VDC-solenoid coil. In operation mode, the current is supplied to the valve coil causing the valve to CLOSE, forcing pump flow to the respective hydraulic circuit. In bypass mode, the coil is de-energized causing the valve to OPEN, allowing the oil to re-circulate either back to tank or to the pump inlet.

TROUBLESHOOTING

The symptoms of a problem in the pump circuit are no operation or slow operation of the loader or packer system. Since the F7000 series uses combined flows, a possible symptom of system malfunction is the packer operating at half the normal speed. On a Rapid Rail body with a Rapid Rail lift, each pump section controls one aspect of the system independent of the other. A malfunction of one pump's section will normally only affect one function of the truck. For example the packer will work correctly but not the loader or vice versa.

There are three primary causes for the pump circuit not to operate properly:

1. Low or no voltage to the unloader valve coil.
2. Malfunction in the unloader valve assembly.
3. Internal problem with the pump.

Perform the following test after finding that there is insufficient or no flow to the loader and/or body valves.

Check the Electrical Supply to the Unloader Valve Coils

With the system turned ON and the engine operating at idle, test the voltage at the coil. It should read a minimum of 10 VDC. If proper voltage is present and the problem persists, proceed to step 2. If the voltage is below 10 VDC, check the electrical system for problems that can cause a drop or loss of voltage to the unloader valve solenoid coil. Some examples are a broken or shorted wire, blown fuse, fault in the side door switch (if equipped), no alternator input or a failed PLC calibration.

Use an ohm meter to check resistance in the coil. If the measurement is less than 5 ohms or more than 20 then the circuit coil is damaged. If the coil is damaged, replace the coil.

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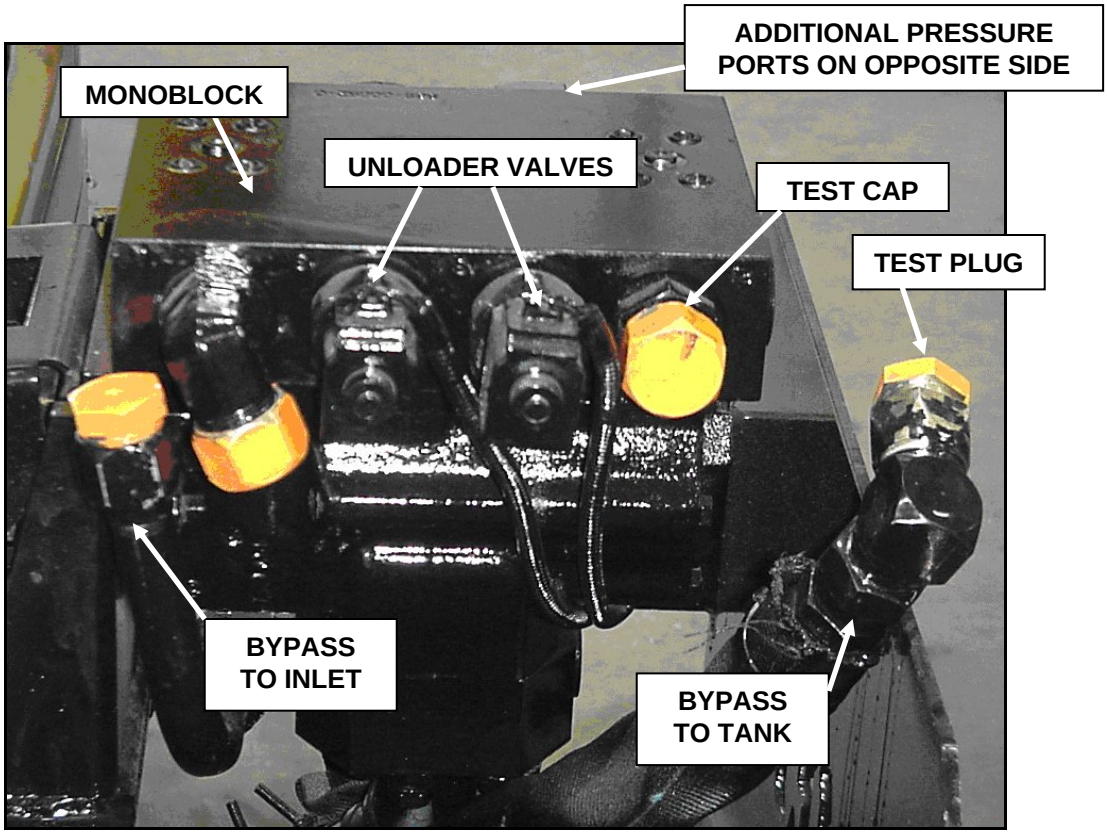
All Units

Eliminate the Unloader Valve from the Circuit

With the engine OFF, remove the bypass line from the pressure block port marked *bypass* . Disconnect the pressure hose or hoses sending oil to the lift and body functions. On the Rapid Rail and Pythons, there are two pressure hoses to be capped; on the F7000 and F4000 there is one hose to be capped. Cap and plug the tube connection for the bypass to the pump inlet. This forces all oil to the hydraulic circuits as if the pump is on. (NOTE: Pump control switches in the cab are no longer effective.)

Restart the truck and test the functions. If the lift and packer functions return to normal operation (speed and pressure within specifications), replace or repair the unloader assembly.

NOTE: If flow is present and the lift or packer operate only with no load, check the main relief valves for proper adjustment and operation.



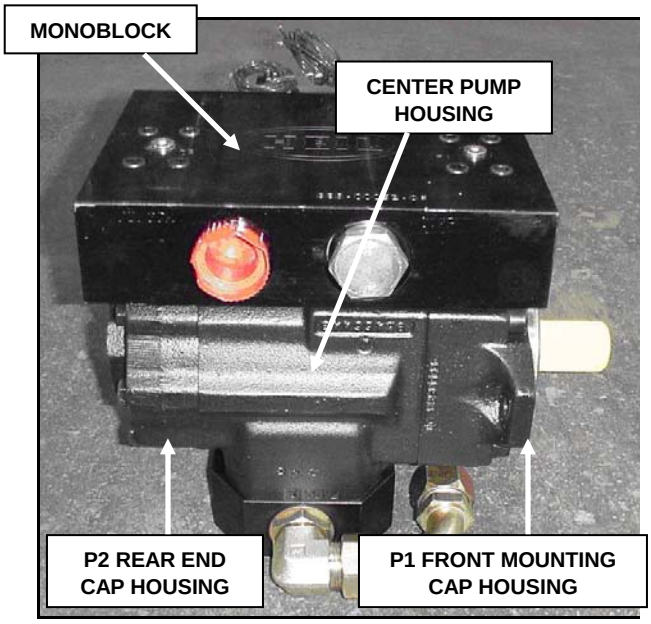
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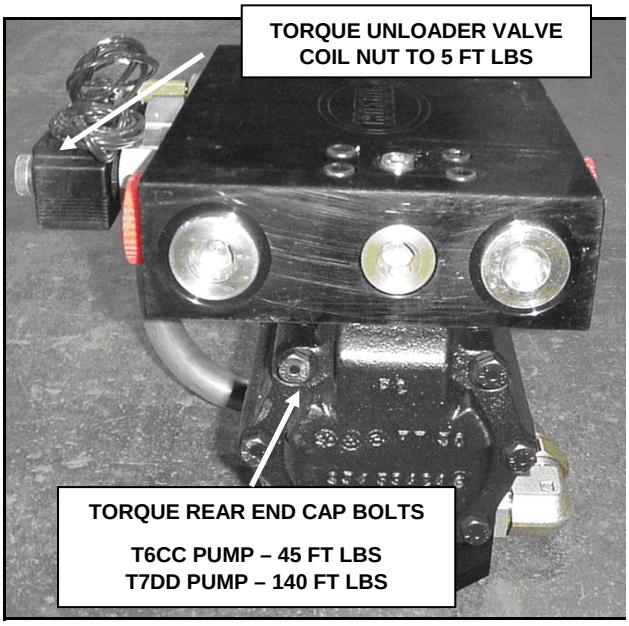
All Units

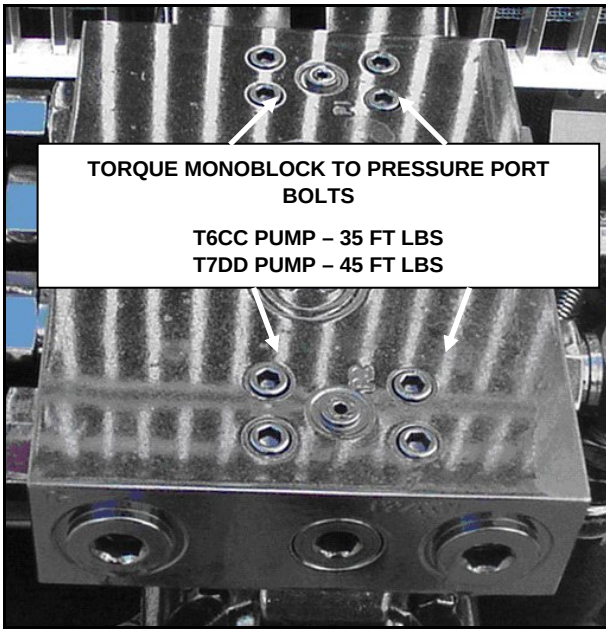
MOUNT PUMP MONOBLOCK TO TANDEM PUMP

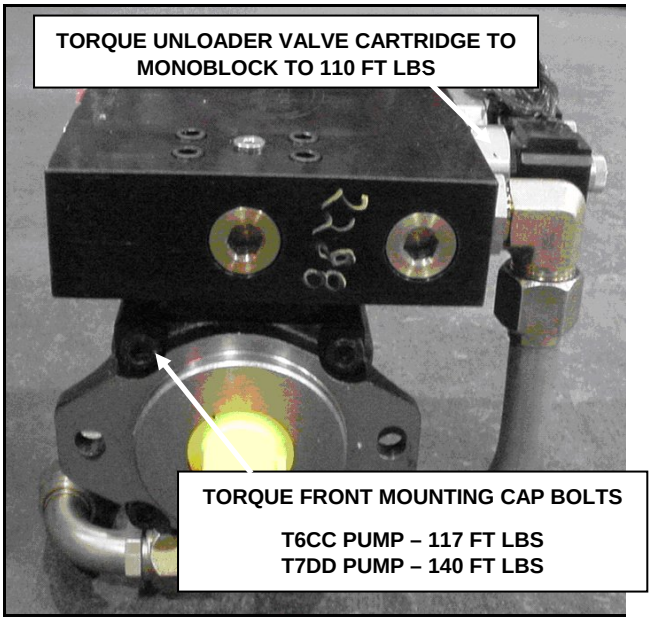
Follow these steps when mounting a monoblock to the tandem pump.

1. Loosen the rear end cap bolts and front mounting cap bolts to allow slight movement between the P1, center pump, and P2 housings. This aligns the P1 and P2 pressure ports with the monoblock.
2. Mount the monoblock using the eight (8) cap screws with hi-collar lock washers and torque the cap screws. **NOTE: Make sure the o-rings stay in place.**
3. Re-torque the bolts on the rear end cap and front mounting cap housings of the pump.
4. If either the unloader valve cartridge or the pilot valve cartridge (that screw into the unloader valve cartridge) is removed, it needs to be re-torqued. Re-torque the unloader cartridge to 110 ft. lbs. and the pilot cartridge (not shown) to 15 ft. lbs.





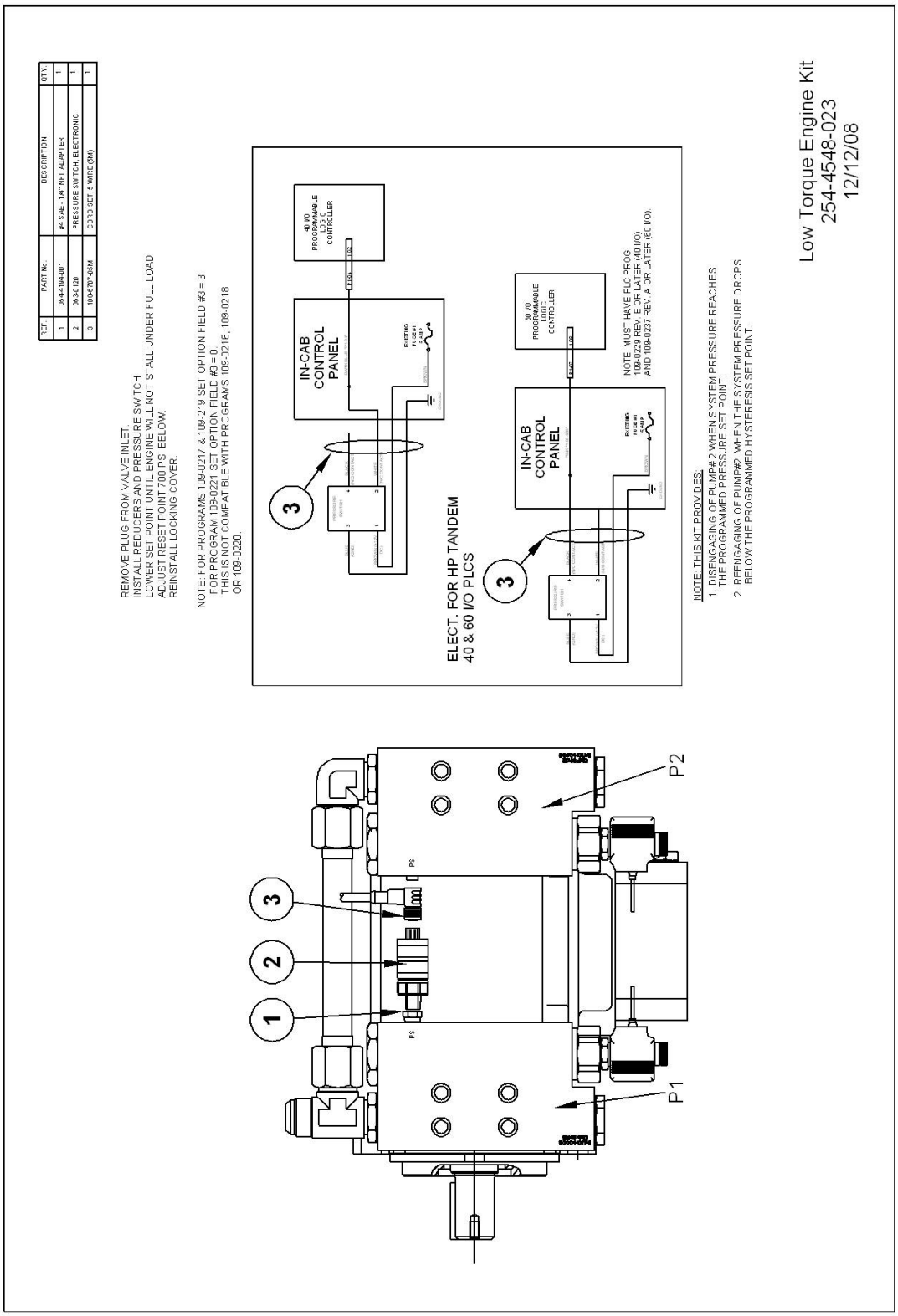




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All Units

PRESSURE SWITCH KIT – LOW TORQUE ENGINES



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DuraPack® 5000



SERVICE MANUAL

SECTION 4
CONTROLS

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SMS4-SWS-706074-0110

Customer Support

Heil Environmental ▪ 4301 Gault Ave. North . Fort Payne, AL 35967-9984 · 866.275.4345

SECTION 4 – CONTROLS

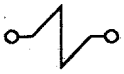
Electrical;
Electrical Symbols and Definitions 4.2
EOS Overspeed Switch and Troubleshooting..... 4.3 thru 4.5
Alternator “R” Stator Terminal Corrosion Protection 4.6
Chassis Interface Relay Bank 4.6.1
Throttle Advance/Limit Kits;
Pneumatic and Mechanical Throttle Advance 4.7
Electronic Controlled Throttle Advance 4.8 thru 4.14
Neutral Switch Kits 4.15 thru 4.24
EOS Electronic Overspeed Kits 4.25 thru 4.33

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SYMBOL DEFINITIONS


BATTERY


FUSE


SOLENOID



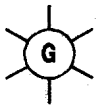
CONTACT RELAY



NORMALLY OPEN CONTACT OF CR1



NORMALLY CLOSED CONTACT OF CR1



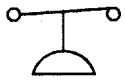
INDICATOR LIGHT (GREEN)

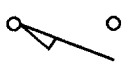

PUSH BUTTON SWITCH NORMALLY CLOSED

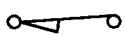

PUSH BUTTON SWITCH NORMALLY OPEN

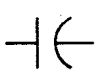

TOGGLE SWITCH


DIODE


PRESSURE SWITCH


LIMIT SWITCH NORMALLY OPEN


LIMIT SWITCH NORMALLY CLOSED


CAPACITOR

OVERSPEED SWITCH

CONNECTING THE VEHICLE WIRING HARNESS

Black — Ground Wire: This wire should be attached to the truck frame. Caution: Body attachments do not always provide good grounds.

Red — Power Input To 108-4545: Connect this line to the output terminal of the on/off switch controlling the clutch or PTO.

Green — Power Output From 108-4545: (Normally open output): Connect this line to solenoid or clutch coil.

Yellow — RPM Input To 108-4545: Connect this line to alternator 'R' terminal.

White — Overspeed Indicator Light: (Normally closed output); Connect this line to overspeed light.

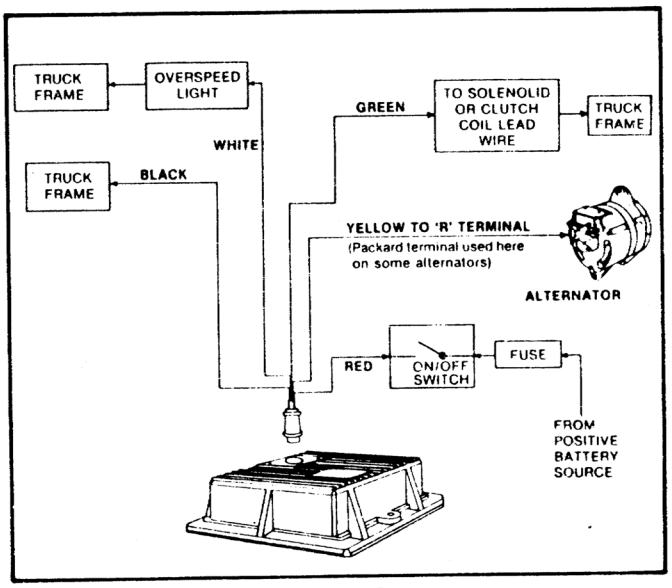


Figure 15C.

VEHICLE WIRING HARNESS TEST

1. Place positive (+) lead from voltmeter in the TACH calibration jack and the negative (-) lead to frame. Set on 0-20 vdc scale.
2. Start engine advance engine to 1200 RPM and return to idle.
3. Increase and decrease engine RPM and observe voltmeter. The voltage should increase and decrease with engine speed.
4. Place positive (+) lead from voltmeter in the engage jack. If there is no voltage then unit is not receiving current on the red wire.
5. When the engine is shut off and the PTO/clutch switch is activated the red overspeed light should be on.

Refer to trouble shooting guide if any test fails.

108-4545 SPEED ADJUSTMENT PROCEDURE USING A VOLTMETER.

1. The 108-4545 has test jacks to allow adjustment by use of a voltmeter. The test jack voltages will be in the 0-6 VDC range. Your voltmeter should be on the lowest voltage selection which covers the range. Use the positive meter probe in the test jacks with the negative probe grounded to truck frame.
2. Start the engine, engage the PTO/clutch switch, briefly advance the engine to 1200 RPM and return to idle.
3. The TACH calibration will set the 108-4545's internal tachometer circuit to match the truck's tachometer. This test jack voltage will rise and fall with the engine speed, just as the vehicle's tachometer. Use the adjustment screw to adjust the voltmeter so that the meter displays 1.0 VDC when the truck TACH shows 1000 RPM. The meter should then display 1.5 VDC at 1500 RPM, 2.0 VDC at 2000 RPM, etc.
4. Once you have the RPM set for 1.0 VDC per 1000 RPM you can turn the engine off.
5. Make sure there is power at the 108-4545 (overspeed light should be on). Place the positive lead into the disengage jack. Using the disengage

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adjustment screw adjust the voltmeter so that the display shows your desired disengagement speed based on the relationship that 1.0 VDC=1000 RPM. (Example: a disengage speed of 1800 RPM will show 1.8 VDC on your voltmeter.)

6. Place the positive lead into the engage jack. Using the engage adjustment screw adjust the voltmeter so that the display shows your desired engagement speed based on the relationship that 1.0 VDC=1000 RPM.

NOTE: The DISENGAGE is to be set first, then the ENGAGE. Also, when the engine is running the ENGAGE test jack will show 6 VDC or 6000 RPM when the 108-4545 has engaged the PTO or pump.

ADJUSTMENT PROCEDURE WITHOUT VOLTMETER

CAUTION: DO NOT TAMPER WITH TACH CALIBRATION SCREW ON 108-4545.

Helpful hint: Place a 12V test light into green wire circuit to help you determine when the PTO/clutch is engaged or disengaged.

1. Start engine, engage PTO/clutch switch, briefly advance engine to 1200 RPM and return to idle.
2. With the PTO/clutch on, turn the disengage screw five turns clockwise and the engage screw five turns clockwise.
3. Advance engine to desired disengage speed and hold.
4. Slowly turn disengage screw counter clockwise until the PTO/clutch turns off. The red overspeed light should come on.
5. Reduce the engine speed to the desired engage speed and hold.
6. Slowly turn engage screw clockwise until the PTO/clutch turns back on.

USING THE ET-100 WITH THE 108-4545

If using the ET-100 Electronic Systems Performance Test Set refer to the ET-100 operating instructions.

An additional set of conversion plugs will be required (108-4545-06) to convert an existing ET-100 for use with the 108-4545

RECALIBRATION PROCEDURES

1. Turn 108-4545 TACH calibration screw 22 turns clockwise.
2. Turn disengage screw 15 turns clockwise.
3. Turn engage screw 15 turns clockwise.
4. Follow the adjustment procedures.

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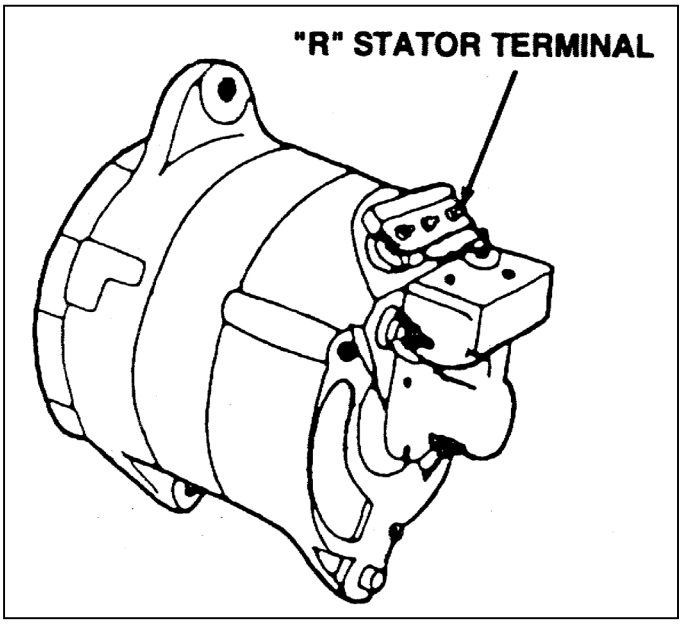
OVERSPEED SWITCH
TROUBLE SHOOTING GUIDE

PROBLEM	TEST Voltmeter/ET-100	CAUSE	SOLUTION
Unit will not engage and overspeed light not on	No current at red wire. /No red light on ET-100.	• Blown fuse. • Poor ground connection. • Reverse polarity. • Connection, splice or harness connection loose.	• See problem "Blown Fuse" • Check crimped and frame connections. • Interchange red and black leads. • Check crimped connections. Make sure pin connector is in proper alignment and ring tight.
Unit will not engage and overspeed light always on	Voltage at TACH jack does **not** increase with engine speed. / No yellow light.	• Alternator not engaged. • Incorrect alternator terminal. • Poor or loose connection.	• Briefly run engine between 1200-1500 RPM. • Contact dealer. • Check crimp and connection of brown wire.
	Voltage at TACH jack does increase and decrease with engine speed. / Yellow light on.	• Poor or loose connection. • Unit out of adjustment.	• Check crimp and connection of green wire. • See adjustment procedure.
Unit will not disengage	Voltage at green wire. / Green light always on.	• Unit out of adjustment. • Faulty 108-4545	• See adjustment procedure. • Return for inspection.
Intermittent operation	Changes in voltage. / Any flashing light.	• Poor connection.	• Check crimped and ground connections.
Blown fuse		• Failed solenoid or clutch coil, shorted output lead, faulty 108-4545	• Examine wiring harness and connections for possible short circuits. Check out and replace faulty components.

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ALTERNATOR “R” STATOR TERMINAL CORROSION PROTECTION

The “R” stator terminal on alternators may become corroded due to oxygen in the atmosphere combining with the impurities on the surface of the exposed conductor. This corrosion may interfere with the alternator’s RPM signal, in turn adversely affecting the performance of the EOS (electronic overspeed switch).



To prevent the corrosion from occurring, a sealant must be applied to the terminal to prevent oxygen in the atmosphere from coming in contact with the conductor.

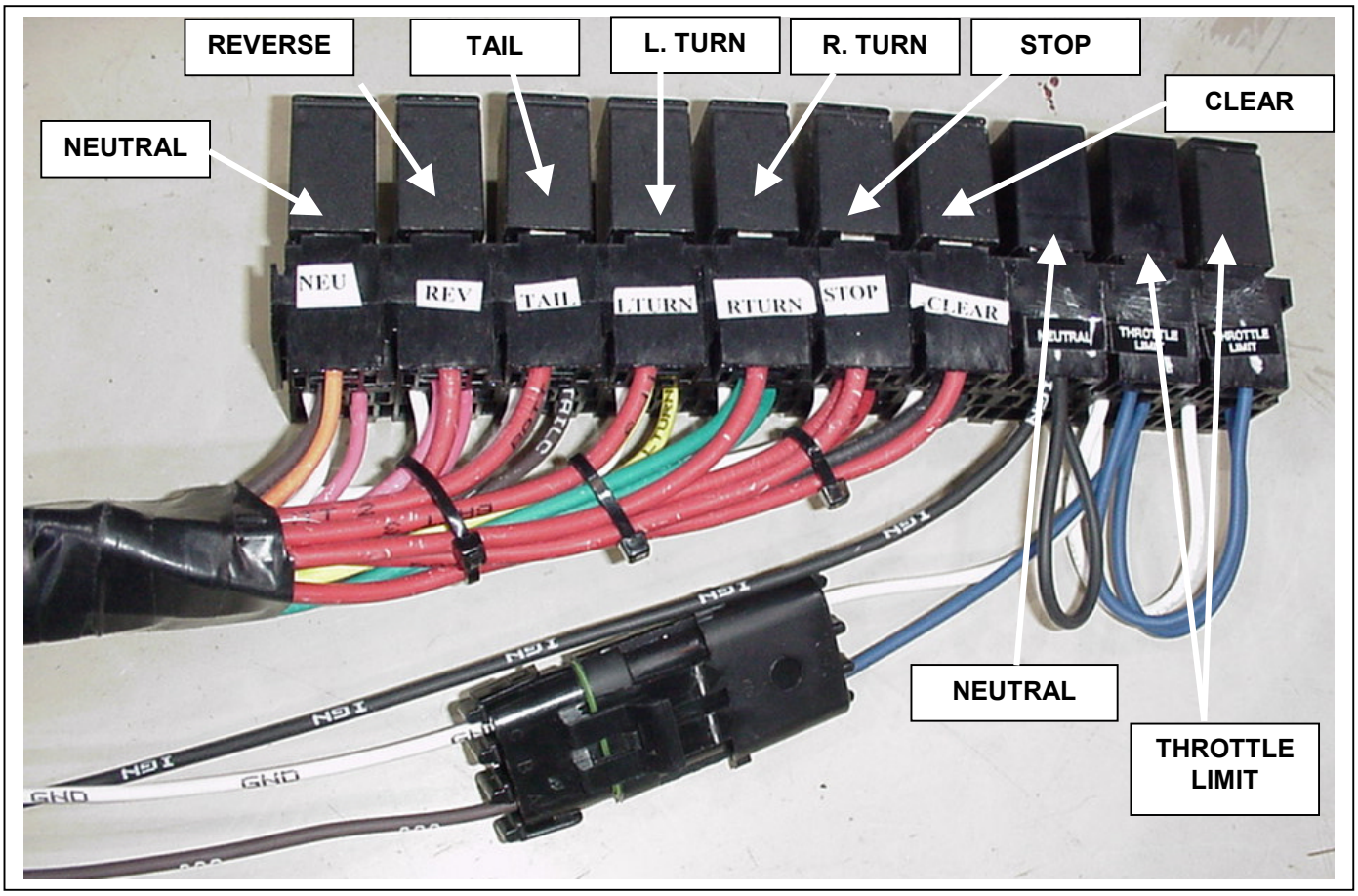
There are two (2) main types of connections on the “R” stator terminal:

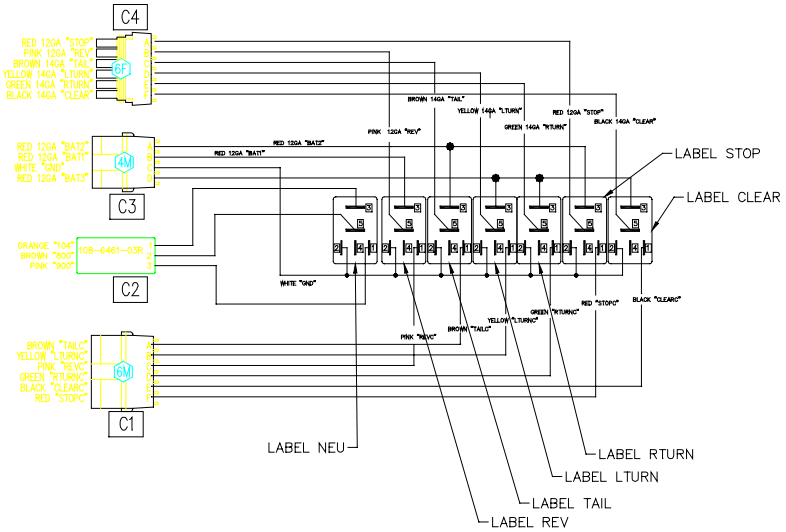
1. A 3/8” female stud type connector and
2. A molded pin plug.

Dipit is recommended for use on the stud type and an antioxidant grease is recommended fro the plug type connection.

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CHASSIS INTERFACE RELAY BANK

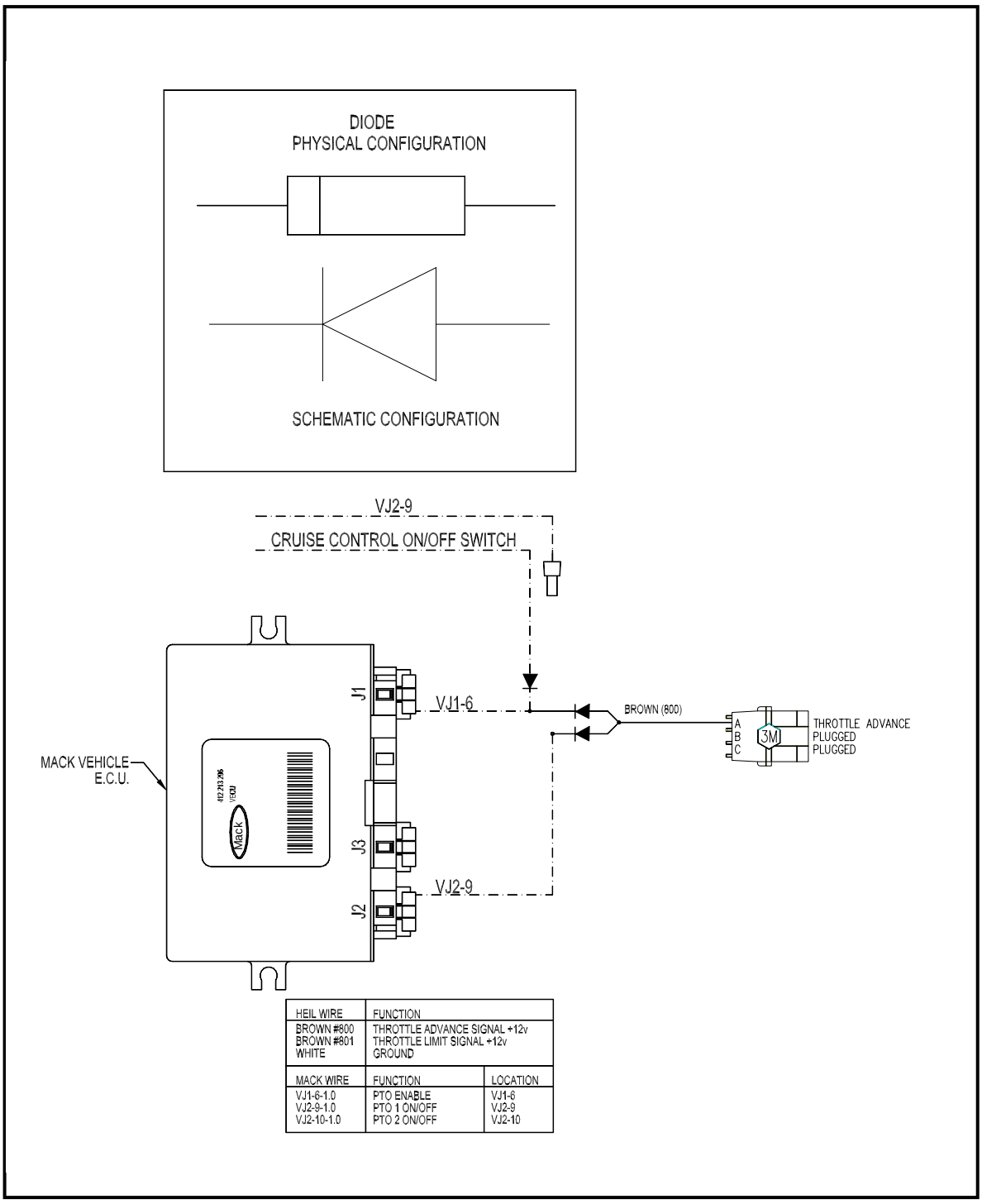




The chassis interface relays are used in all rear loaders to carry the load current for lights, throttle stop, throttle limit, neutral, etc. The number of relays used may vary depending on chassis and unit set up.

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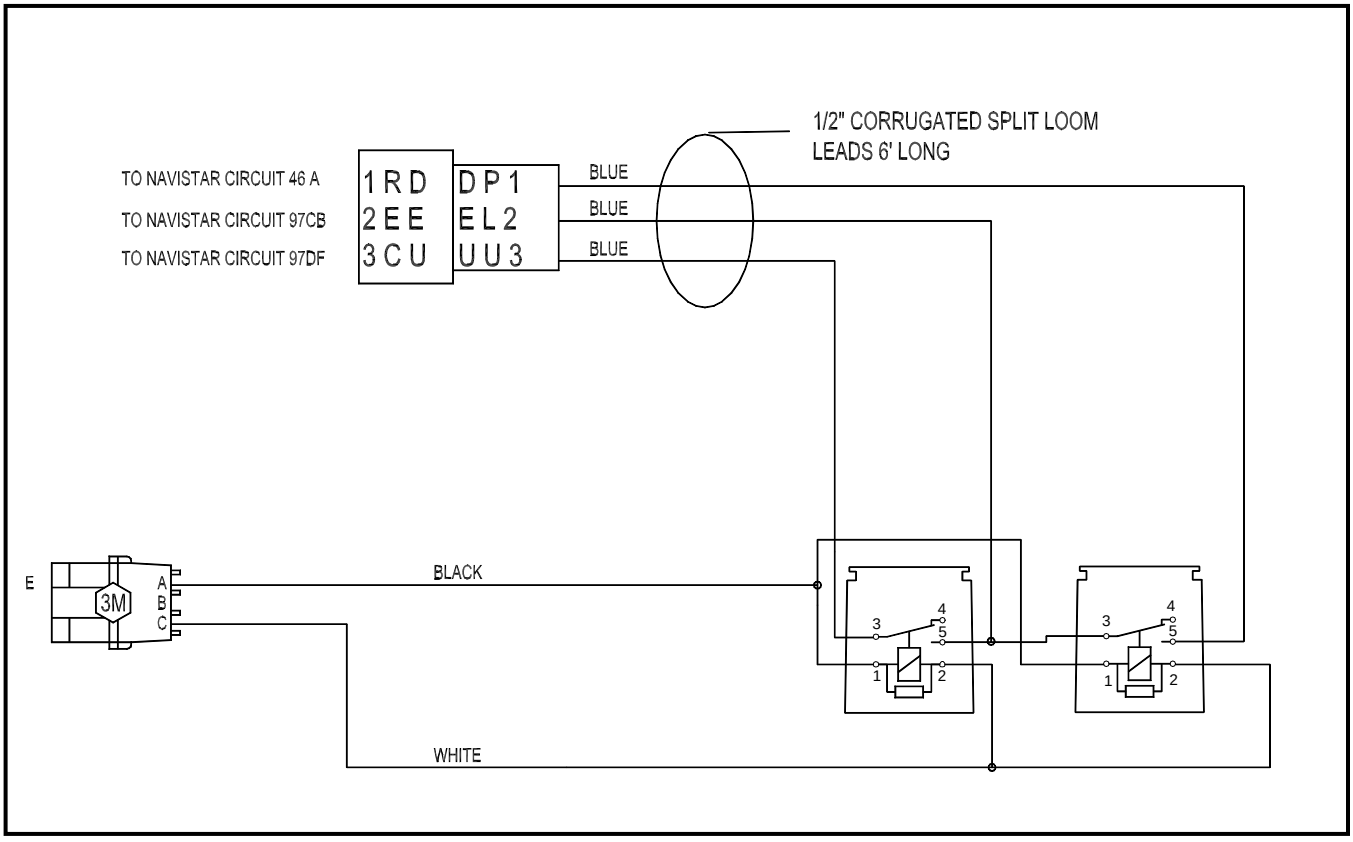
THROTTLE ADVANCE for ELECTRONIC CONTROLLED Vmack ENGINE 272-1818-129



HEIL WIRE	FUNCTION	
BROWN #800 BROWN #801 WHITE	THROTTLE ADVANCE SIGNAL +12v THROTTLE LIMIT SIGNAL +12v GROUND	
MACK WIRE	FUNCTION	LOCATION
VJ1-6-1.0 VJ2-9-1.0 VJ2-10-1.0	PTO ENABLE PTO 1 ON/OFF PTO 2 ON/OFF	VJ1-6 VJ2-9 VJ2-10

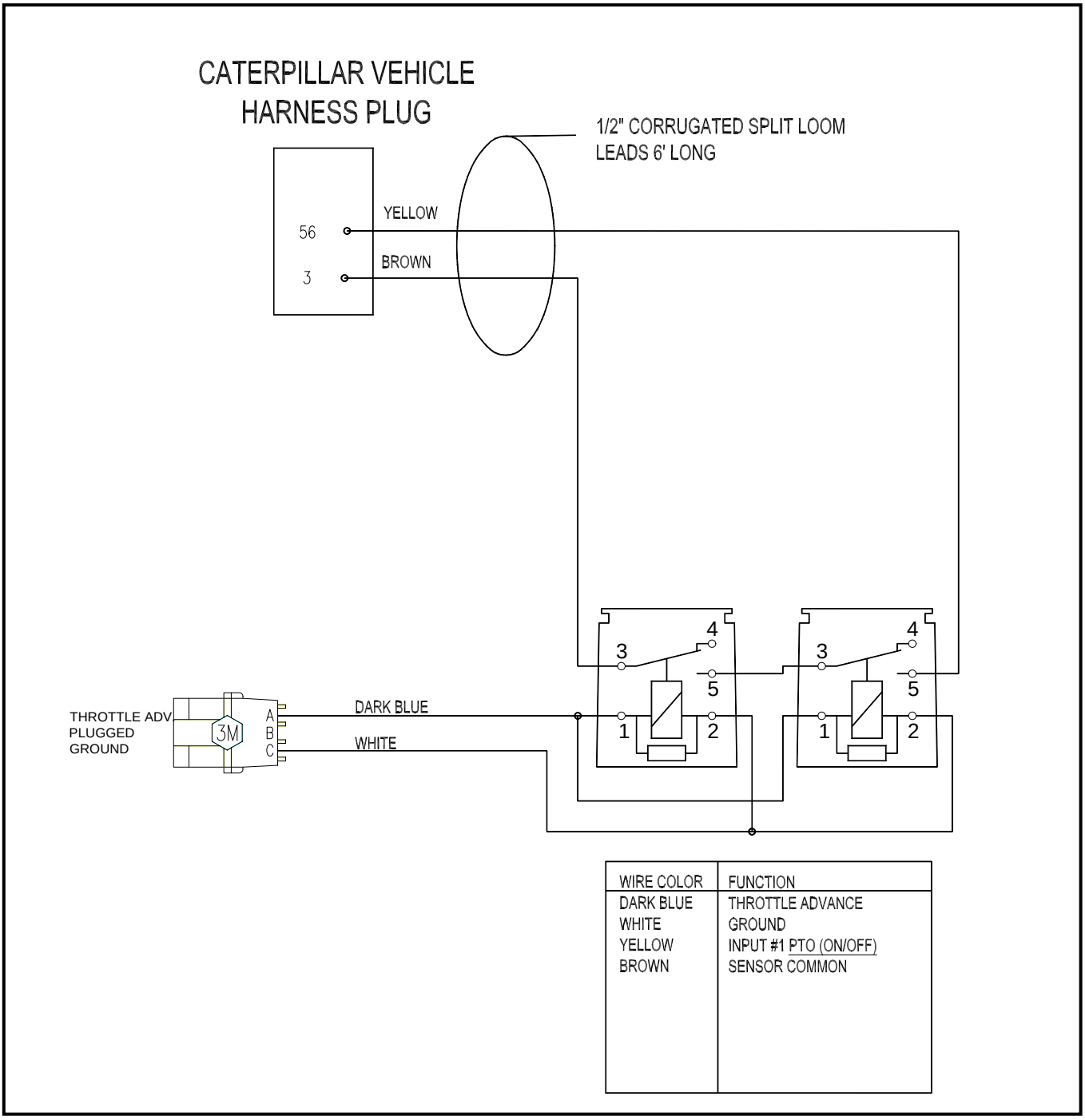
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THROTTLE ADVANCE for ELECTRONIC CONTROLLED NAVISTAR ENGINE 272-1818-120



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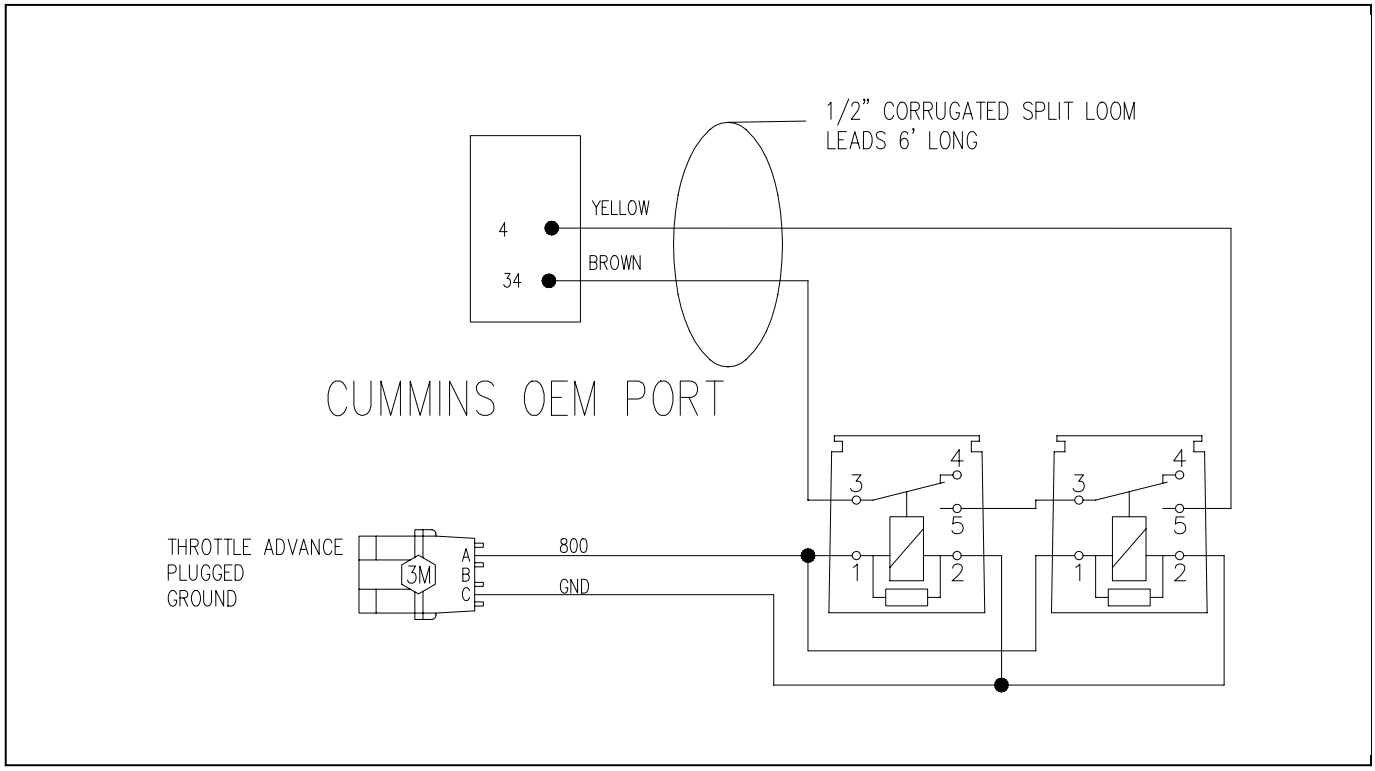
THROTTLE ADVANCE for ELECTRONIC CONTROLLED CAT ENGINE 272-1818-121



WIRE COLOR	FUNCTION
DARK BLUE	THROTTLE ADVANCE
WHITE	GROUND
YELLOW	INPUT #1 PTO (ON/OFF)
BROWN	SENSOR COMMON

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THROTTLE ADVANCE for ELECTRONIC CONTROLLED CUMMINS (GAS RECIRCULATION) ENGINE 272-1818-203



PROGRAMING PARAMETERS FOR THROTTLE ADVANCE

FROM THE COMPUTER DESKTOP OPEN CUMMINS INSITE (NOT INSITE PRO)
LOWER RH CORNER OF SCREEN SELECT INSITE TOOL TYPE
SELECT ADJUSTMENTS
SELECT FEATURES AND PARAMETERS
SELECT REMOTE PTO
SELECT NUMBER OF SPEEDS AND SET TO 1
NOTE: DOUBLE CLICK ON PARAMETERS TO CHANGE AFTER CHANGE IS COMPLETE DEPRESS THE ENTER KEY
SELECT SET SPEED 1 AND SET TO THROTTLE ADVANCE SPEED DESIRED
SELECT RAMP RAMP AND SET TO 500 RPM/S
LEAVE MAX SPEED AT 6MPH (CHANGE IF NECESSARY)
RIGHT CLICK ON ICON AT TOP OF SCREEN WHICH LOOKS LIKE A COMPUTER SCREEN
SELECT YES FROM POP UP BOX
WHEN INSTRUCTED TURN OFF KEY SWITCH FOR 30 SECONDS
IF PARAMETERS WERE SUCCESSFULLY CHANGED YOU WILL GET THE FOLLOWING MESSAGE "ALL PARAMETERS SUCCESSFULLY WRITTEN.
SELECT OKAY

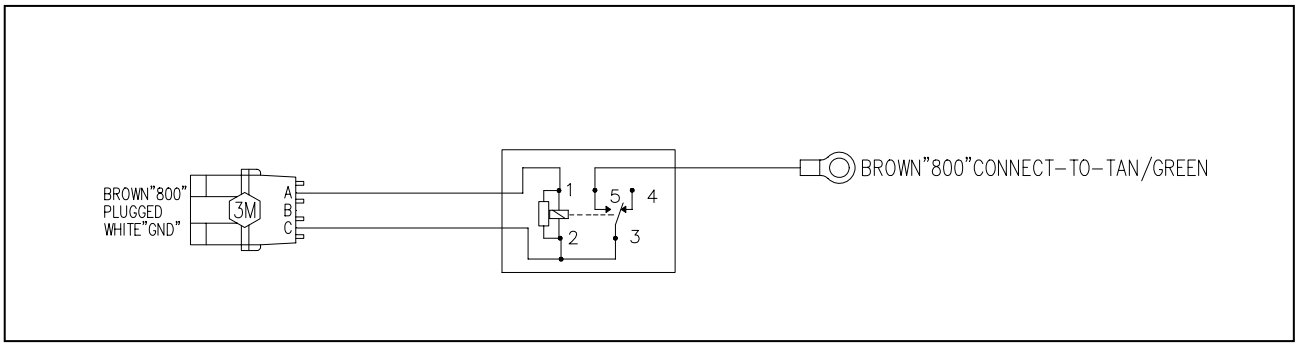
WIRE	FUNCTION
800	THROTTLE ADVANCE
GND	GROUND
YELLOW	REMOTE PRO
BROWN	SENSOR COMMON

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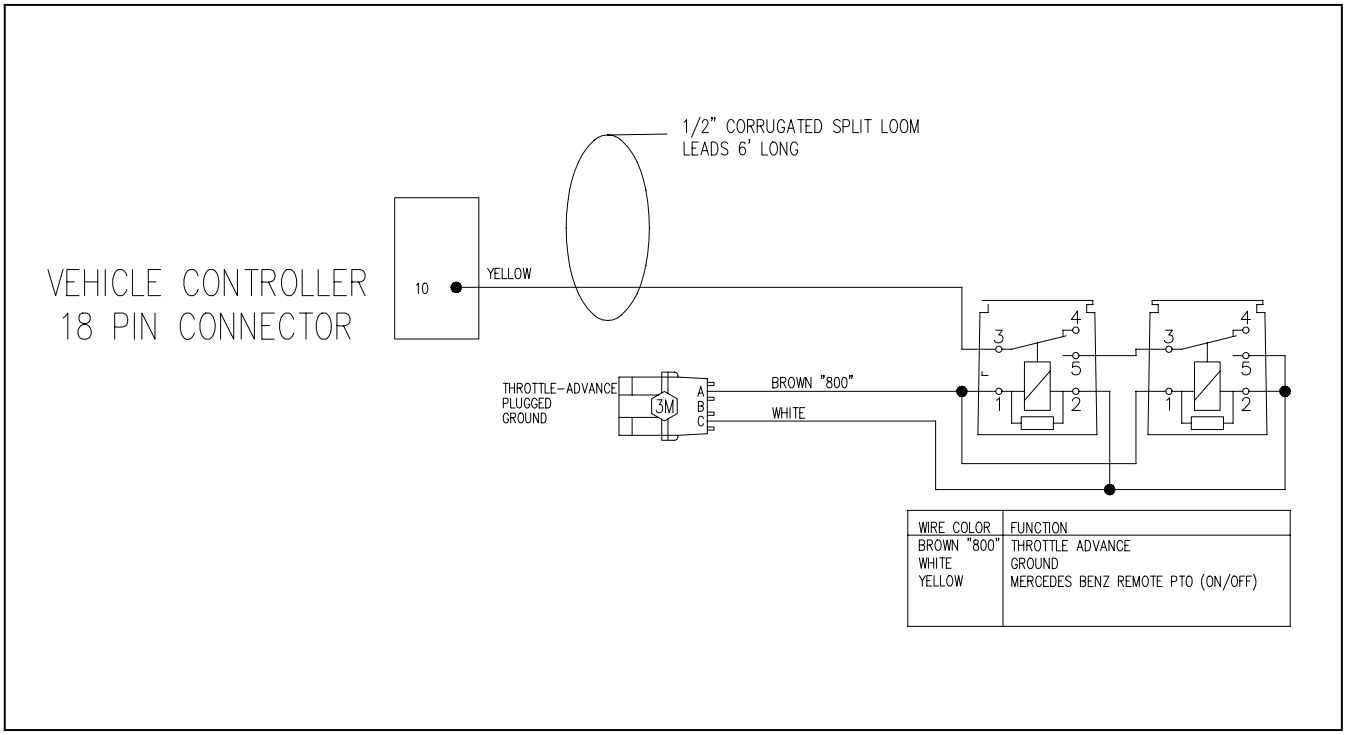
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THROTTLE ADVANCE for ELECTRONIC CONTROLLED CRANE CARRIER ENGINE 272-1818-141



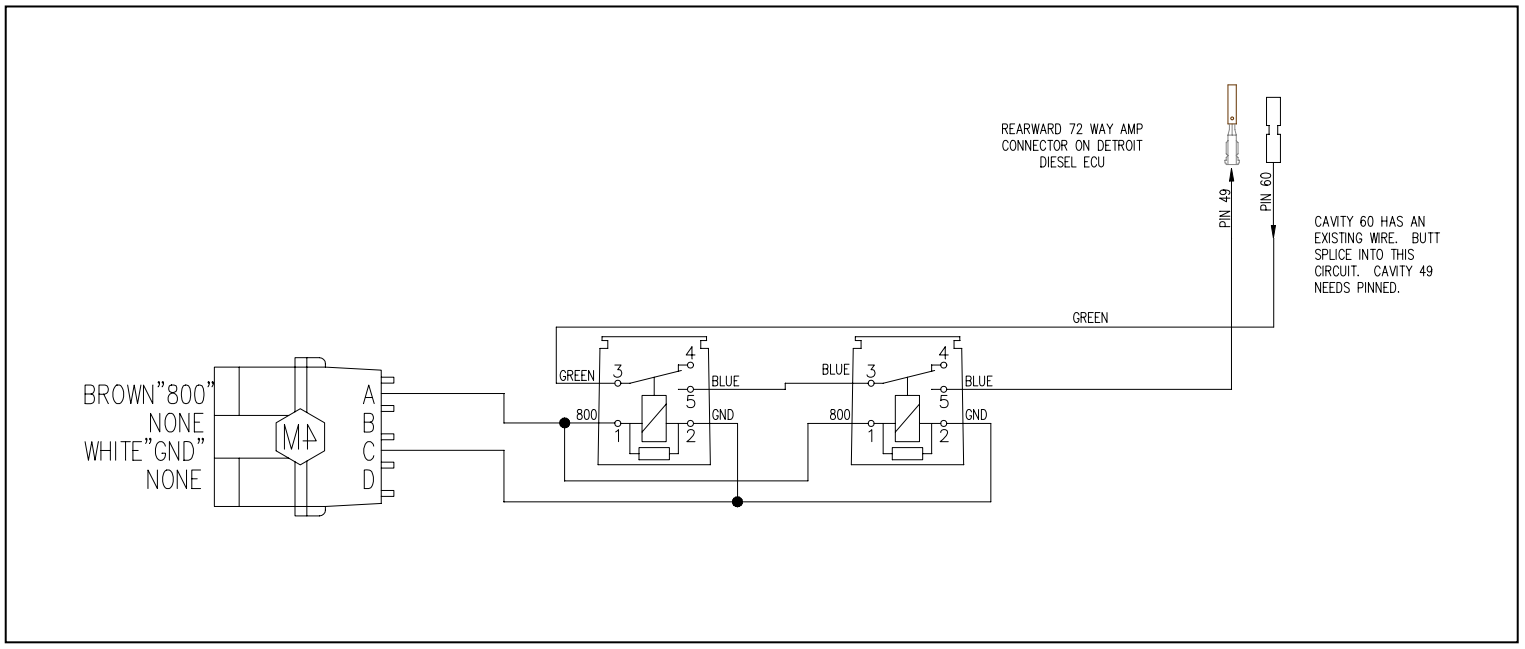
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THROTTLE ADVANCE for ELECTRONIC CONTROLLED MERCEDES BENZ ENGINE 272-1818-144



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THROTTLE ADVANCE for ELECTRONIC CONTROLLED DDEC V ENGINE 272-1818-208



PROGRAMING PARAMETERS FOR THROTTLE ADVANCE

USING THE DDDL SOFTWARE PERFORM THE FOLLOWING PROGRAMMING:

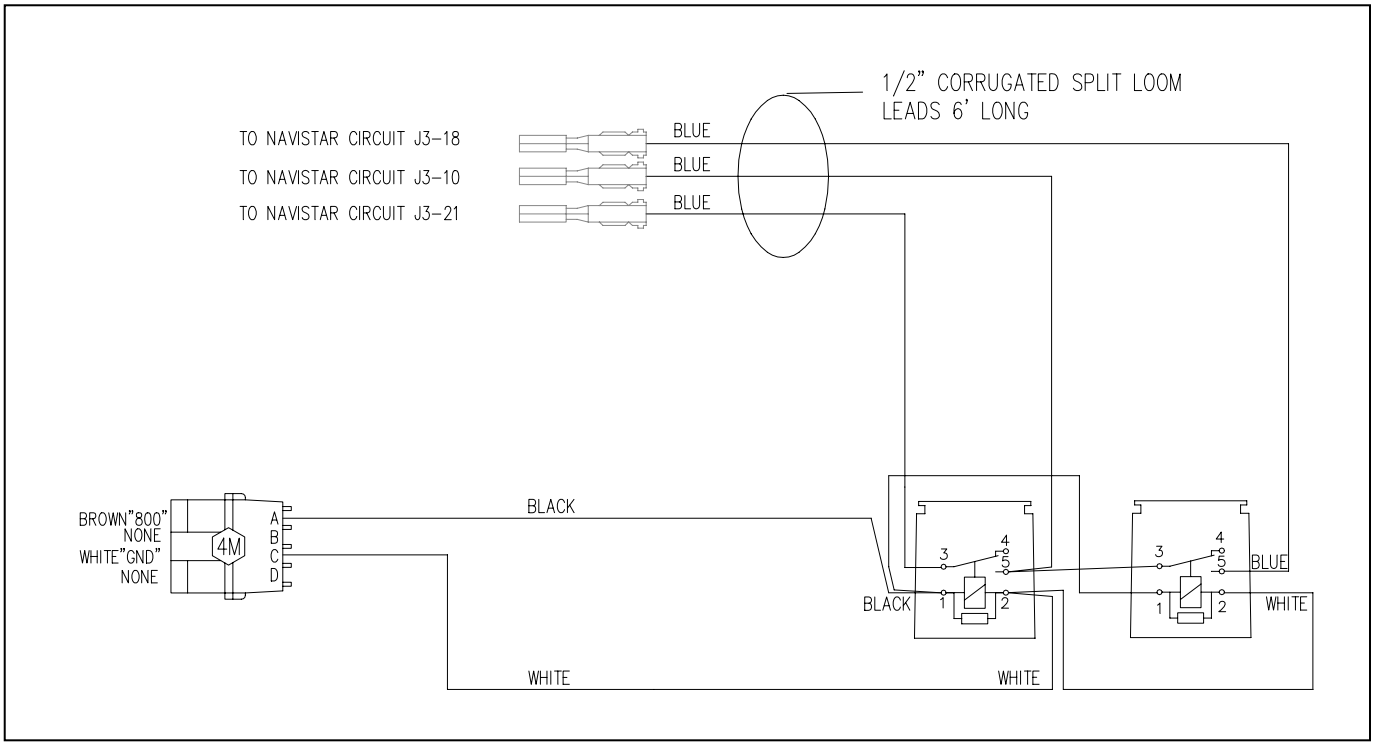
1: CONNECT TO VEHICLE
2: OPEN DDDL PROGRAM
3: INSIDE ISD/VSG TAB, SET THE VARIABLE SPEED TO 1200–1400 (RANGE 600–1600)
4: INSIDE CRUISE TAB, SET INITIAL RPM TO SAME VALUE AS PREVIOUS STEP 1200–1400
5. TRANSMIT

FOR ANY QUESTIONS CALL DDEC HOTLINE: 313–592–7050 OR 313–592–5800

* NOTE: IF CUSTOMER HAS NOT ORDERED THROTTLE ADV/PTO FEATURES FROM FACTORY, THE ECU WILL HAVE TO BE "REBURNED" AT A LOCAL DETROIT DEALER. WILL NOT WORK WITHOUT IT. THERE IS A DEALER CHARGE FOR THIS.

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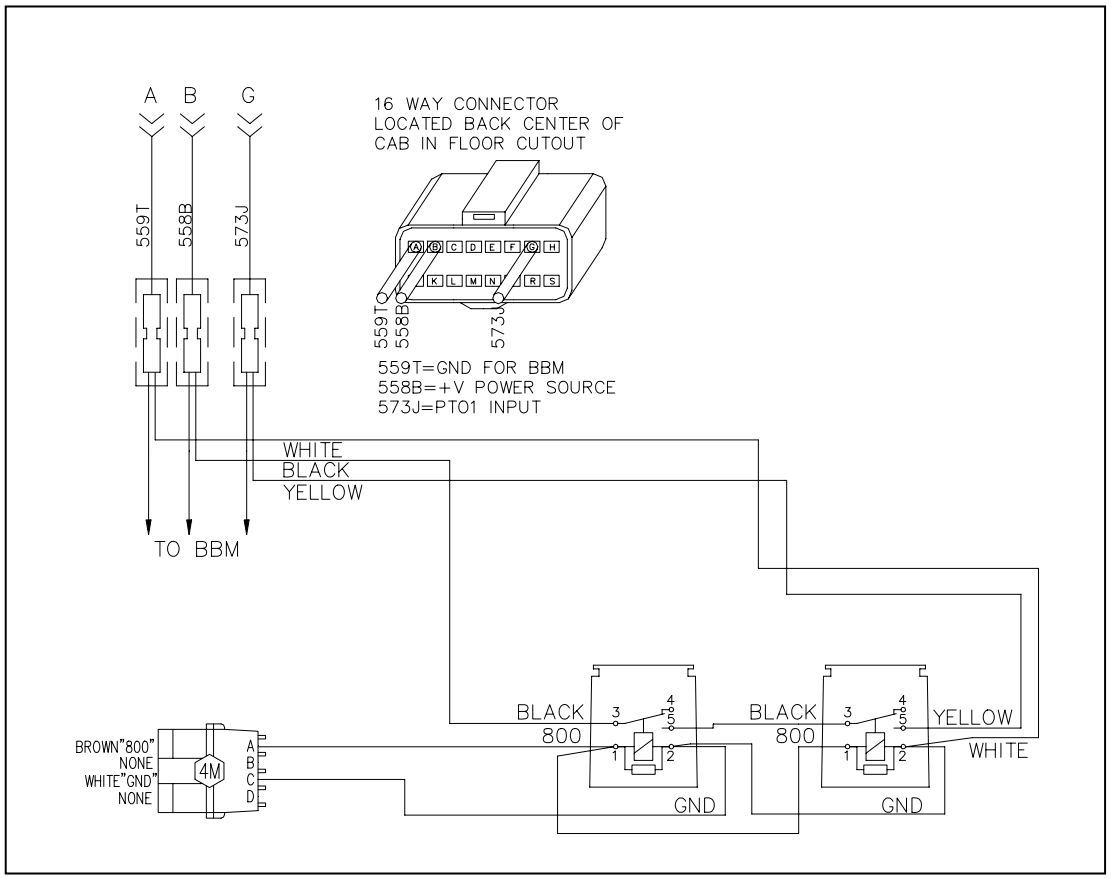
THROTTLE ADVANCE for ELECTRONIC CONTROLLED NAVISTAR w/REMOTE MODULE ENGINE 272-1818-209



PROGRAMMING PARAMETERS NAVISTARS THROTTLE ADVANCE		
PTO MODE	=	REMOTE ONLY
IN CAB MODE	=	MOBILE VARIABLE
DISABLE CAB CONTROLS	=	YES
SET SPEED	=	(****) THROTTLE ADV. RPM
RESUME SPEED	=	(****) THROTTLE ADV. SPEED
MAXIMUM PTO RPM	=	(****) THROTTLE ADV. SPEED
P.T.O. SPEED RAMP RATE	=	500 RPM/SECOND
MAX ROAD SPEED FOR PTO	=	5 MPH

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THROTTLE ADVANCE for ELECTRONIC CONTROLLED VOLVO VN-VHD w/BB MODULE ENGINE 272-1818-218



PROGRAMMING PARAMETERS:

- Turn on Computer
- Plug in Interface to Vehicle/Turn key
- After Computer boots up, plug interface in to computer
- Double Click on "VOLVO" Icon
- CHANGE THE FOLLOWING VECU PARAMETERS:
 - AZG=0
 - XM=0
 - DA=LOWEST POSSIBLE VALUE
 - XP=0
 - AND=1200(FMPUMP) OR 1400(PTO)
 - ANF=500
 - ANE=1200(FMPUMP) OR 1400(PTO)
 - RT=50
 - QP=1
 - AZH=1
 - XO=0
- CHANGE THE FOLLOWING BBM PARAMETERS:
 - IC=1
 - YJ=1
 - HH=0
 - BRR=0
 - BRV=0
 - HZ=250 (RAMP RATE)
 - HE=0
 - HT=0
 - AA=1200(FMPUMP) OR 1400(PTO)
 - DC=500
 - HB=1200(FMPUMP) OR 1400(PTO)
 - IF=50
 - ID=0
 - IE=0
 - YO=0
- SEND CHANGES
- COMPLETE!

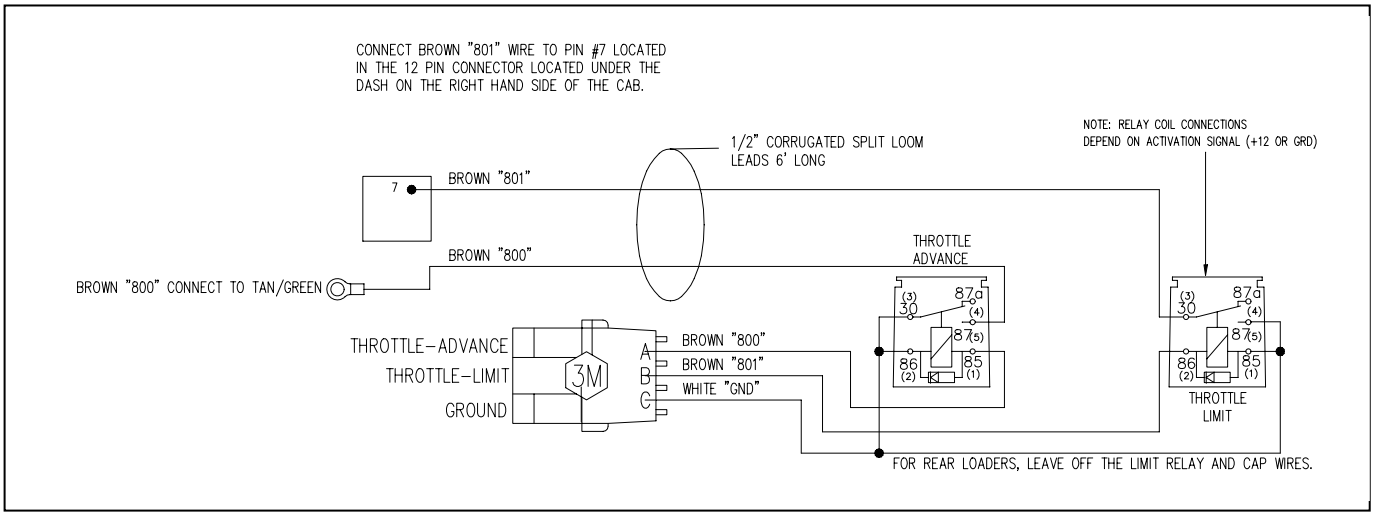
*NOTE: 0=NO 1=YES

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THROTTLE ADVANCE for ELECTRONIC CONTROLLED CRANE CARRIER w/J. DEERE ENGINE 272-8539-009



WIRE COLOR	FUNCTION
BROWN "800"	THROTTLE ADVANCE
BROWN "801"	THROTTLE LIMIT
WHITE "GND"	GROUND
BROWN 801	PIN #7 IN JOHN DEERE 12 PIN CONNECTOR

THE BROWN "800" WIRE MUST BE LANDED ON THE CCC TAN W/GREEN WIRE LOCATED IN THE CCC JUNCTION BOX ON THE LEFT FENDER

PROGRAMING PARAMETERS FOR THROTTLE LIMIT AND ADVANCE

IDLE, ELEVATED AND THROTTLE LIMIT
ELEVATED IDLE SETUP
THROTTLE ADV (rpm) 1200 FRONT MOUNT PUMP
THROTTLE ADV (rpm) 1350 PTO PUMP

ELEVATED IDLE OPTIONS = NO
ENABLE ELEVATED IDLE NEUTRAL/PARK INTERLOCK

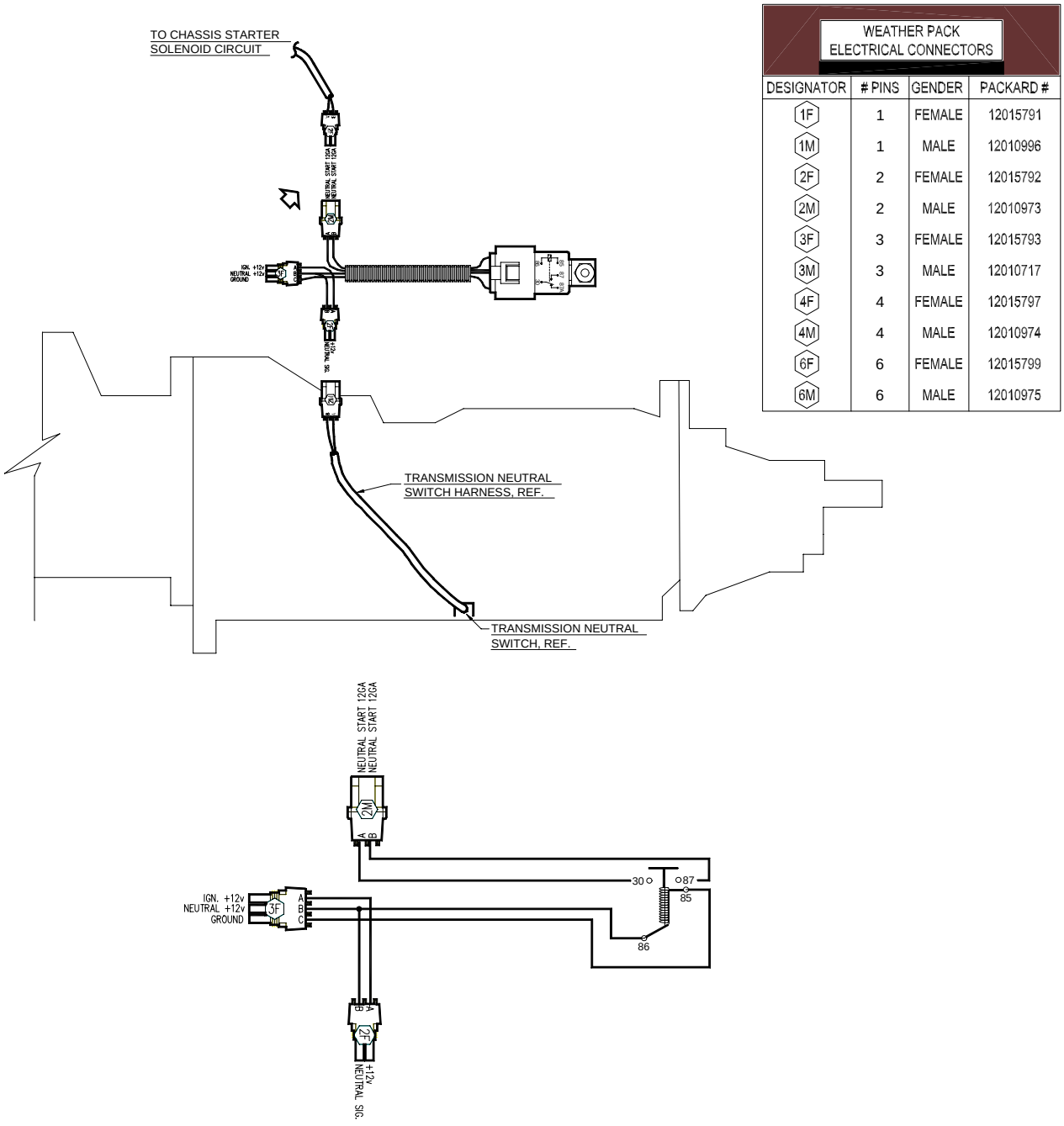
THROTTLE LIMIT SETUP = YES ☒
ENABLE THROTTLE LIMIT = 1450
MAXIMUM THROTTLE LIMIT

FOOT PEDAL AND REMOTE THROTTLE CONTROL
ENABLE FOOT PEDAL INHIBIT SWITCH = NO

GET COPY OF CCC PROGRAM PARAMETERS FROM RW SPENCER 918-836-1651 X228, THEN CALL LOCAL JOHN DEERE DEALER TO PROGRAM ENGINE.

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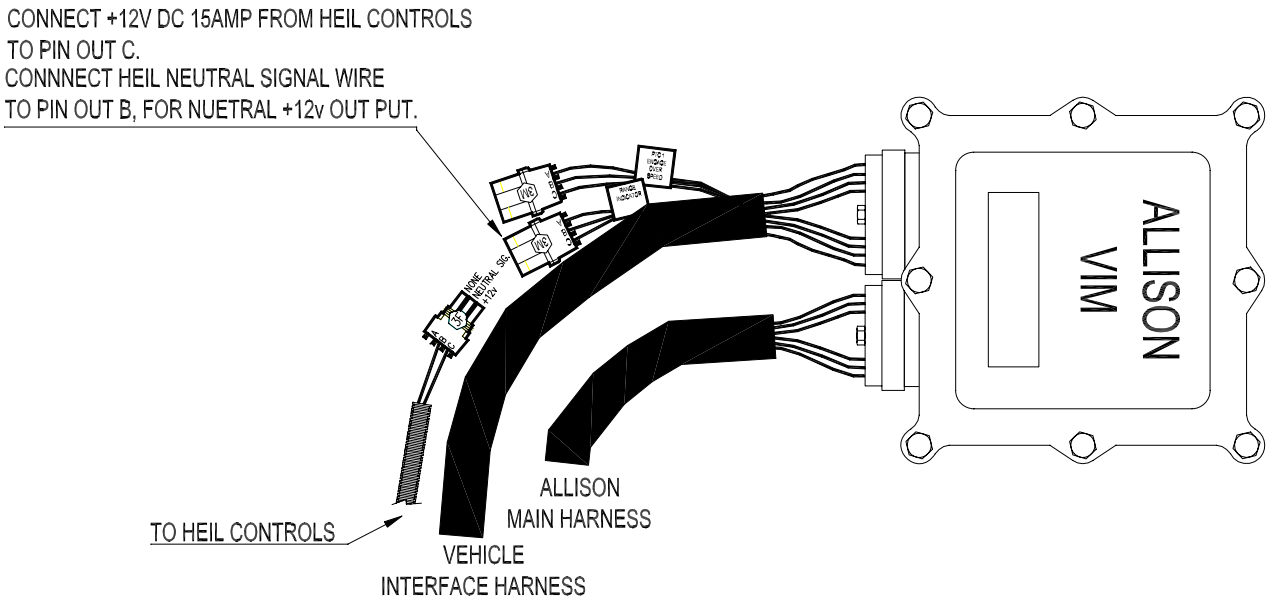
NEUTRAL SWITCH KIT for AUTOMATIC TRANSMISSION (NON-ELECTRONIC)
272-3183-01



WEATHER PACK ELECTRICAL CONNECTORS			
DESIGNATOR	# PINS	GENDER	PACKARD #
1F	1	FEMALE	12015791
1M	1	MALE	12010996
2F	2	FEMALE	12015792
2M	2	MALE	12010973
3F	3	FEMALE	12015793
3M	3	MALE	12010717
4F	4	FEMALE	12015797
4M	4	MALE	12010974
6F	6	FEMALE	12015799
6M	6	MALE	12010975

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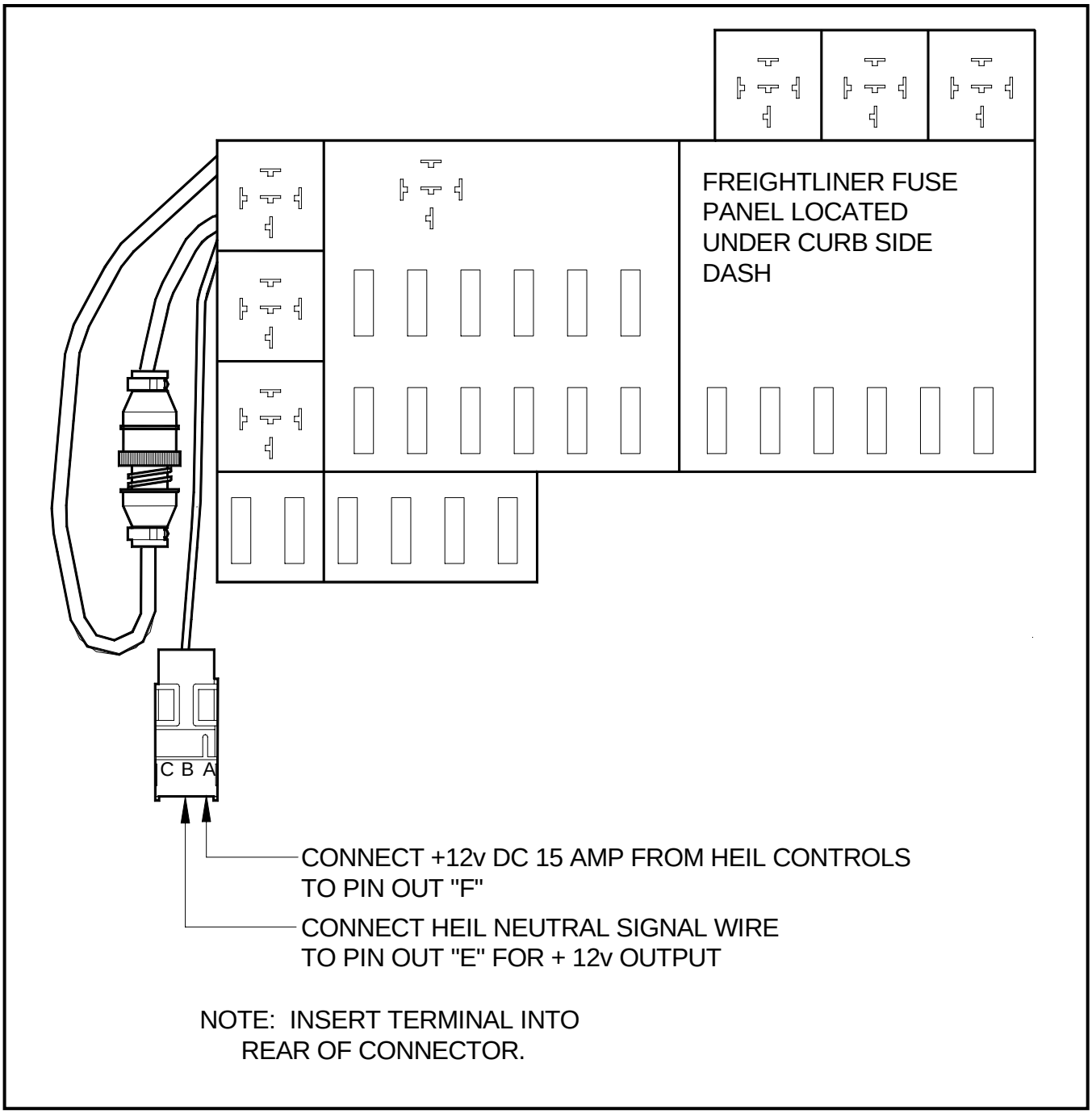
NEUTRAL SWITCH KIT for 320 PTERBILT CHASSIS with ALLISON WORLD TRANSMISSION
272-3183-03



WEATHER PACK ELECTRICAL CONNECTORS			
DESIGNATOR	# PINS	GENDER	PACKARD #
1F	1	FEMALE	12015791
1M	1	MALE	12010996
2F	2	FEMALE	12015792
2M	2	MALE	12010973
3F	3	FEMALE	12015793
3M	3	MALE	12010717
4F	4	FEMALE	12015797
4M	4	MALE	12010974
6F	6	FEMALE	12015799
6M	6	MALE	12010975

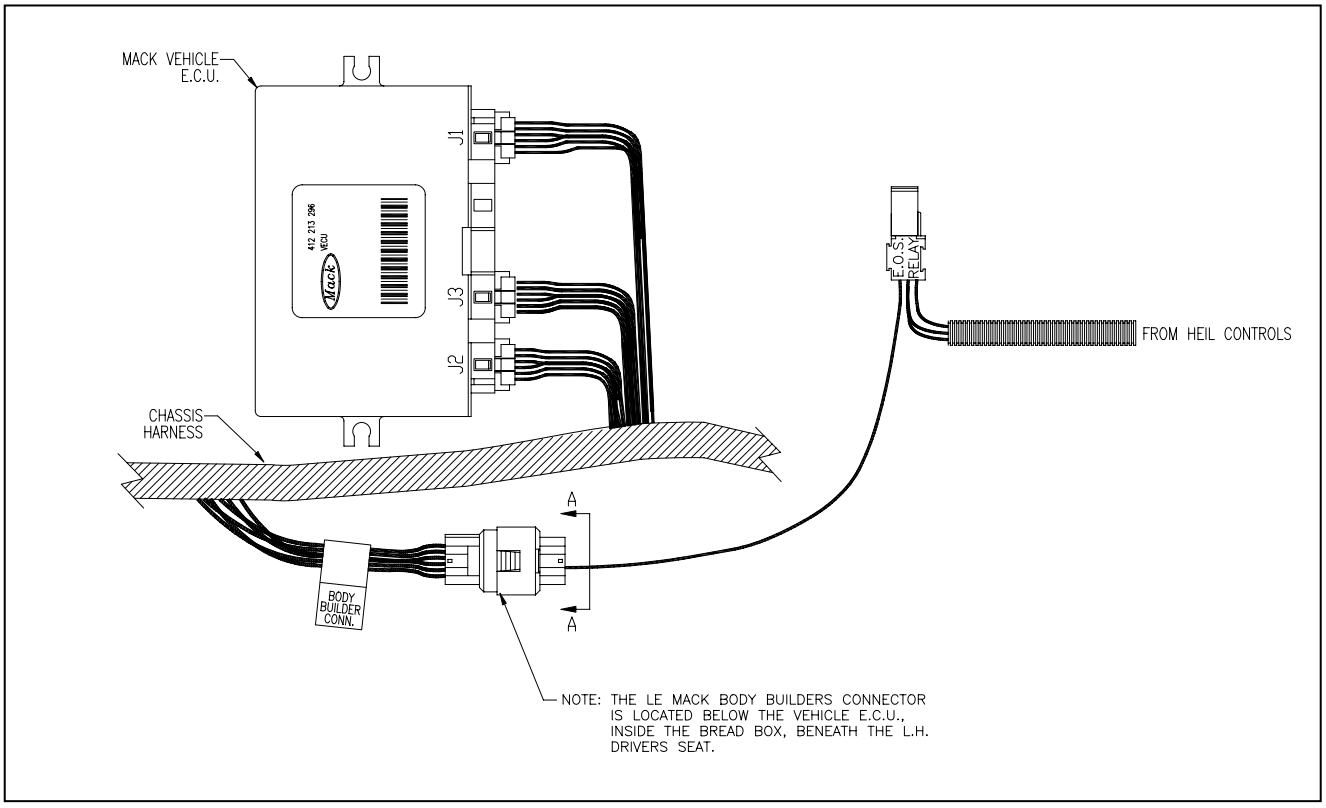
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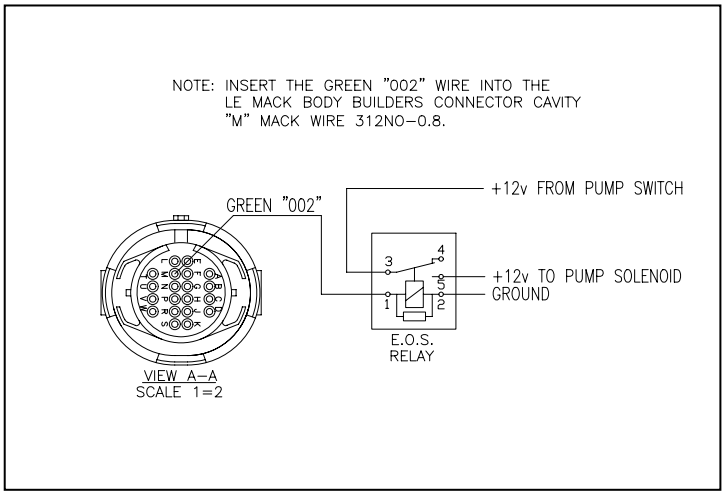
NEUTRAL SWITCH KIT for FREIGHTLINER CHASSIS and ALLISON WORLD TRANSMISSION 272-3183-005



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NEUTRAL SWITCH KIT for STERLING ACTERA CHASSIS with ALLISON WORLD TRANSMISSION
272-3183-010

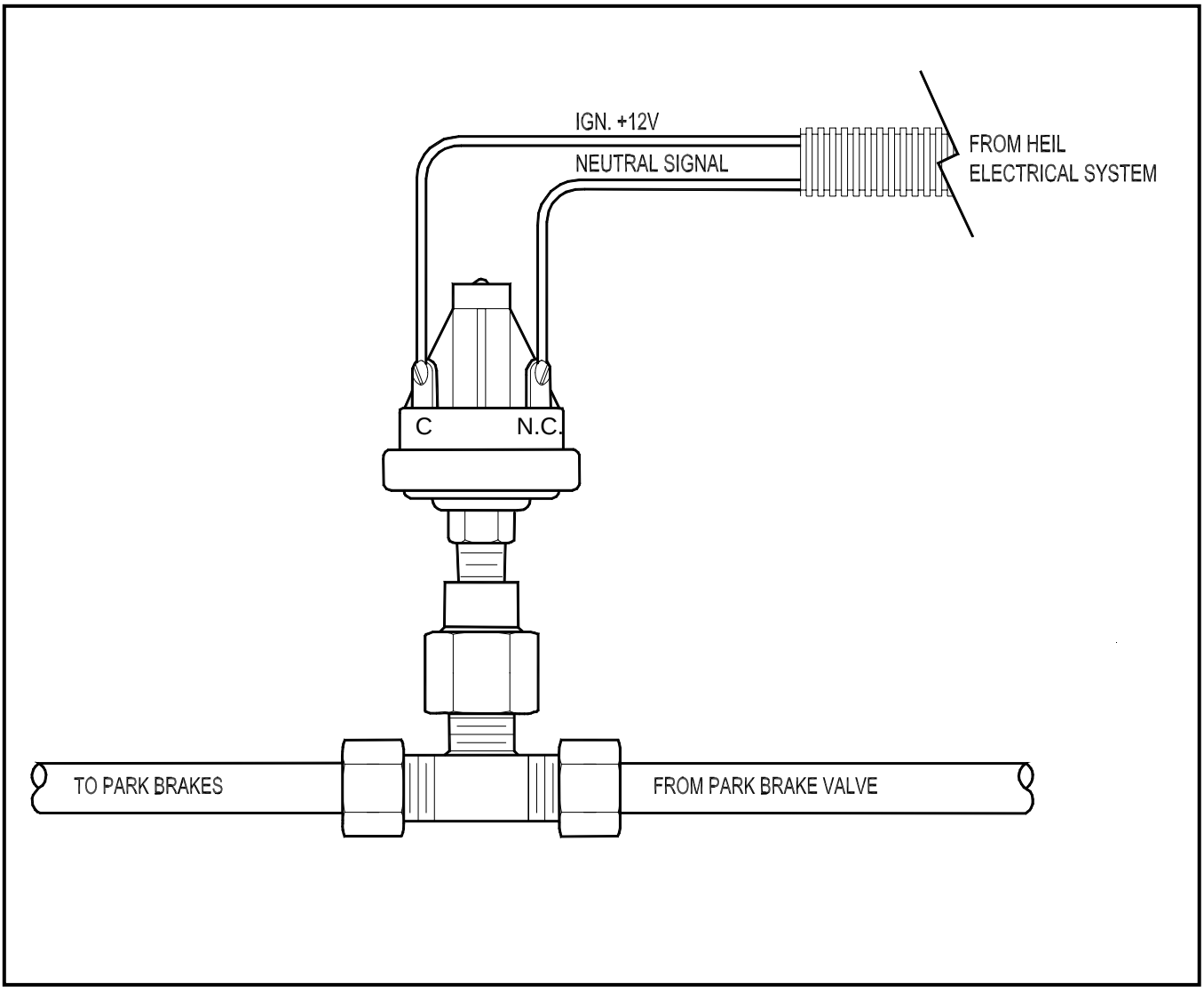




PROGRAMMING PARAMETERS FOR WT TRANS. E.O.S.		
THE MODIFIABLE PARAMETERS ARE:		
ENABLE/DISABLE WIRE 112	=	ENABLE
MAX. ENGINE SPEED FOR PTO ENGAGEMENT	=	900 RPM
MAX. ENGINE SPEED FOR PTO OPERATION	=	**** RPM
MAX. OUTPUT SPEED FOR PTO ENGAGEMENT	=	DEFAULT
MAX. OUTPUT SPEED FOR PTO OPERATION	=	DEFAULT

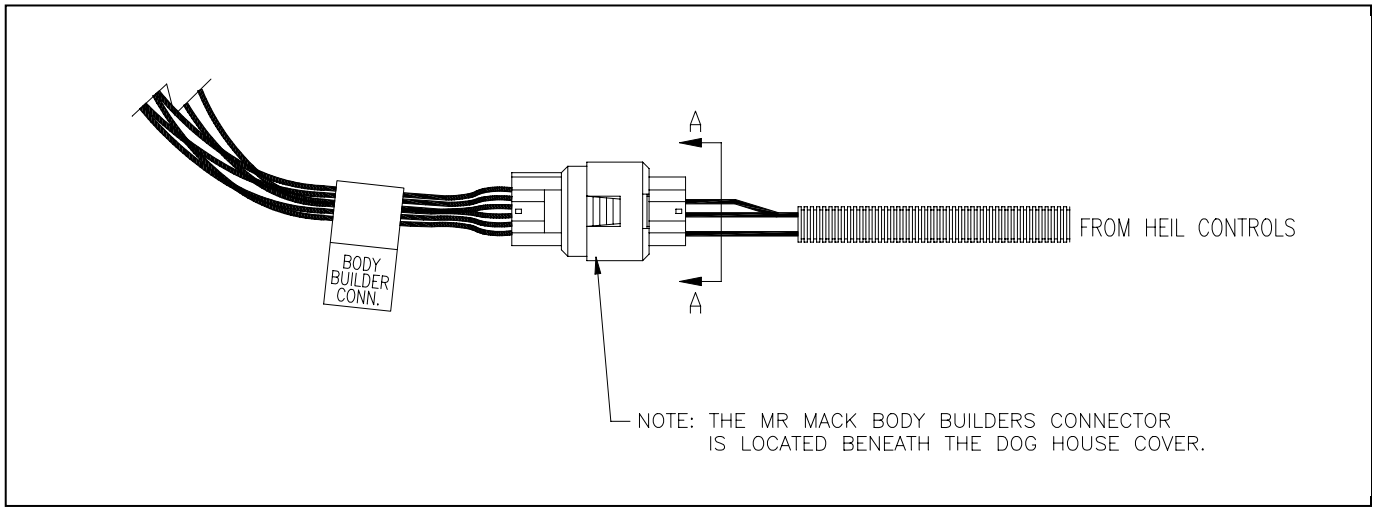
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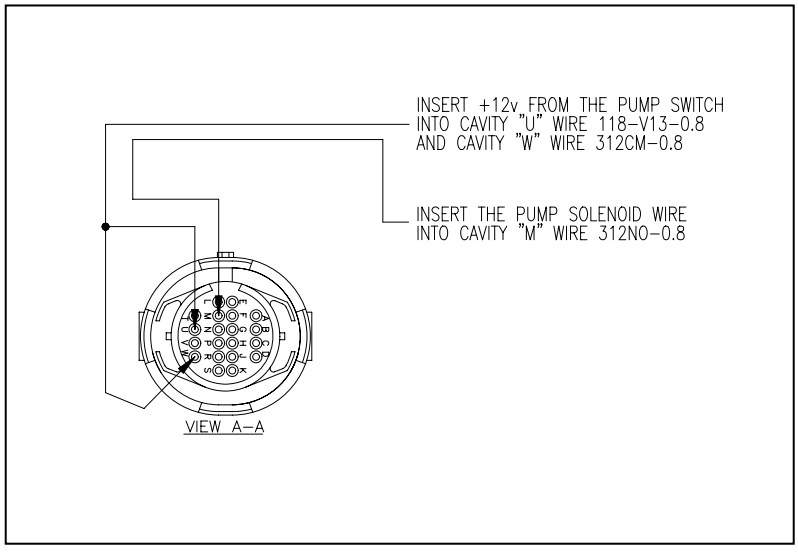
NEUTRAL SWITCH KIT for MANUAL TRANSMISSION
272-3183-007



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NEUTRAL SWITCH KIT for MACK GRANITE CHASSIS with ALLISON WORLD TRANSMISSION 272-3183-011





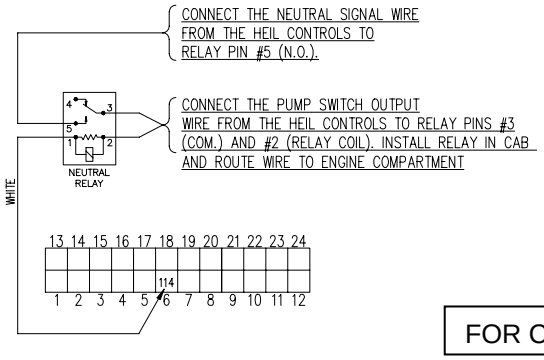
PROGRAMMING PARAMETERS FOR WT TRANS. E.O.S.

THE MODIFIABLE PARAMETERS ARE:

ENABLE/DISABLE WIRE 112	=	ENABLE
MAX. ENGINE SPEED FOR PTO ENGAGEMENT	=	900 RPM
MAX. ENGINE SPEED FOR PTO OPERATION	=	**** RPM
MAX. OUTPUT SPEED FOR PTO ENGAGEMENT	=	DEFAULT
MAX. OUTPUT SPEED FOR PTO OPERATION	=	DEFAULT

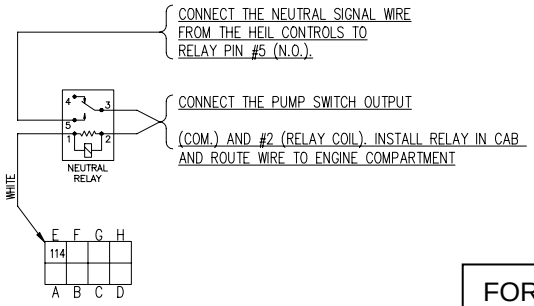
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NEUTRAL SWITCH KIT for NAVISTAR NGV CHASSIS with ALLISON WORLD TRANSMISSION 272-3183-103



THE NGV CHASSIS WITH AUTO NEUTRAL HAS A 24 PIN (2 ROWS OF 12) CONNECTOR LOCATED TO THE RIGHT OF THE STEERING COLUMN TOWARD THE ENGINE. SPLICE INTO WIRE 114 LEAVING THIS CONNECTOR AND RUN WIRE INTO THE CAB. INSTALL THE RELAY AND ASSOCIATED WIRING IN THE CAB.

FOR CHASSIS WITH AUTO NEUTRAL

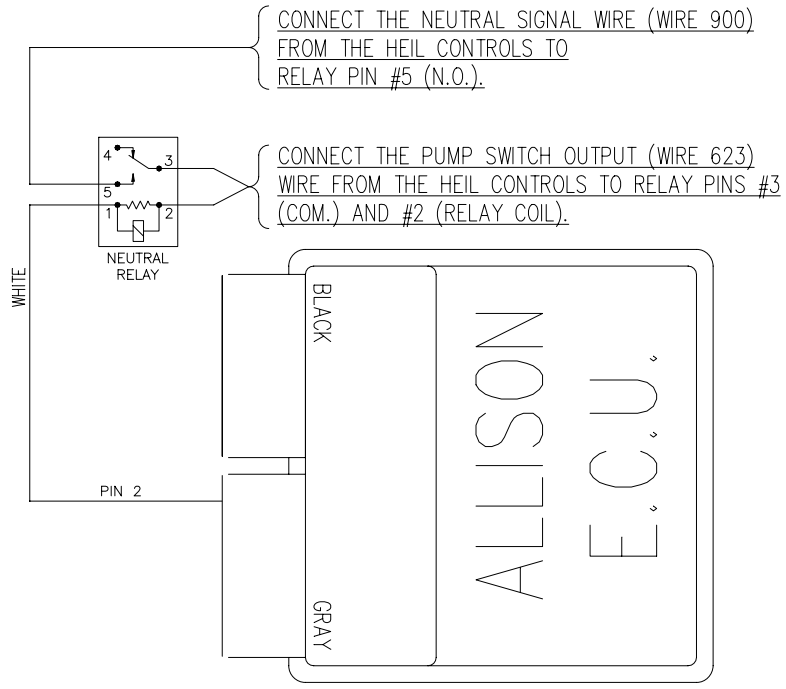


THE NGV CHASSIS WITHOUT AUTO NEUTRAL HAS A 8 PIN (4 ROWS OF 12) CONNECTOR LOCATED TO THE RIGHT OF THE STEERING COLUMN TOWARD THE ENGINE. SPLICE INTO WIRE 114 LEAVING THIS CONNECTOR AND RUN WIRE INTO THE CAB. INSTALL THE RELAY AND ASSOCIATED WIRING IN THE CAB.

FOR CHASSIS WITHOUT AUTO NEUTRAL

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NEUTRAL SWITCH KIT for FREIGHTLINER CHASSIS with ALLISON WORLD TRANSMISSION
272-3183-104

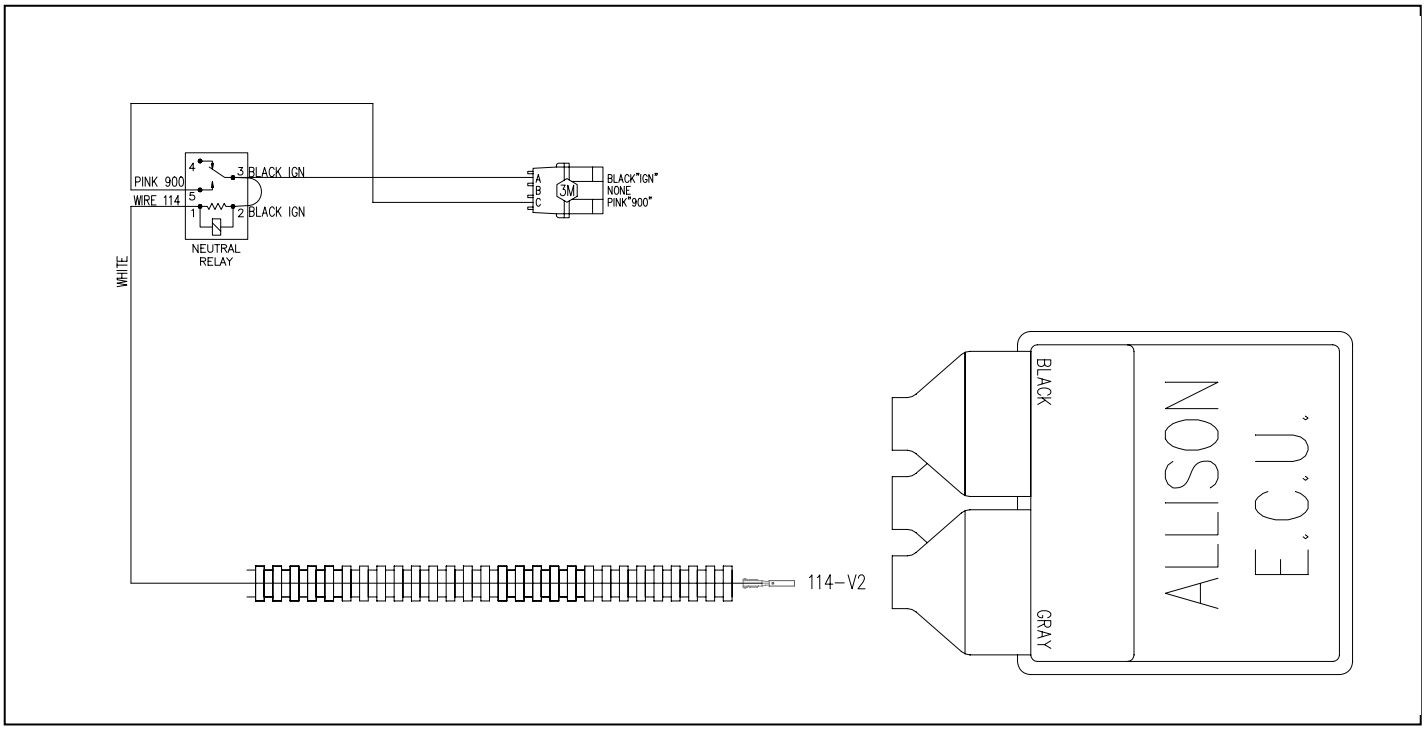


ALLISON E.C.U.

THE ECU IS LOCATED UNDER THE CAB ON THE LEFT HAND SIDE OF THE TRUCK. IT IS ON TOP OF A PLATE. THIS PLATE IS LOCATED OUTSIDE THE CHASSIS RAILS BETWEEN THE FRONT LEFT WHEEL AND THE BUMPER.

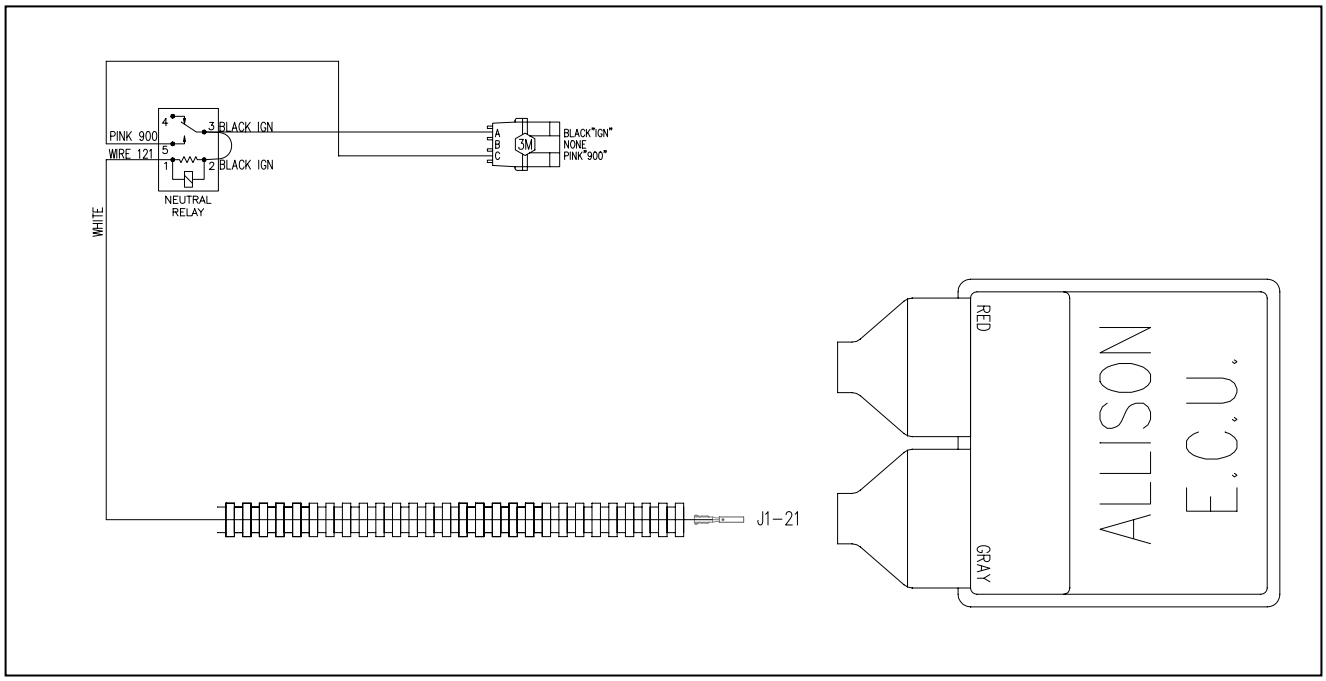
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NEUTRAL SWITCH KIT for GENERAL 3000, 4000 RDS CHASSIS with ALLISON WORLD TRANSMISSION
272-3183-106



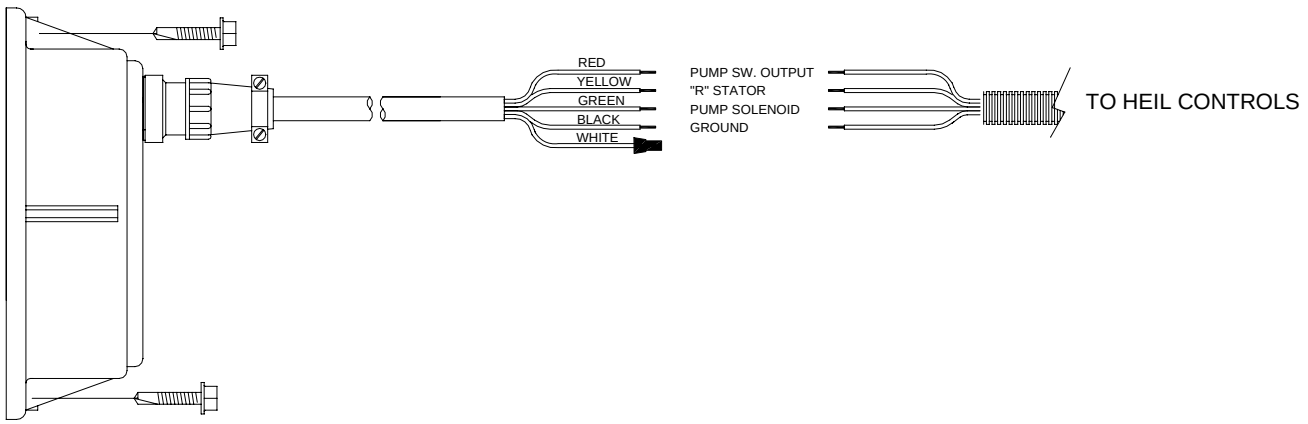
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NEUTRAL SWITCH KIT for GENERAL 1000, 2000 RDS CHASSIS with ALLISON WORLD TRANSMISSION
272-3183-107



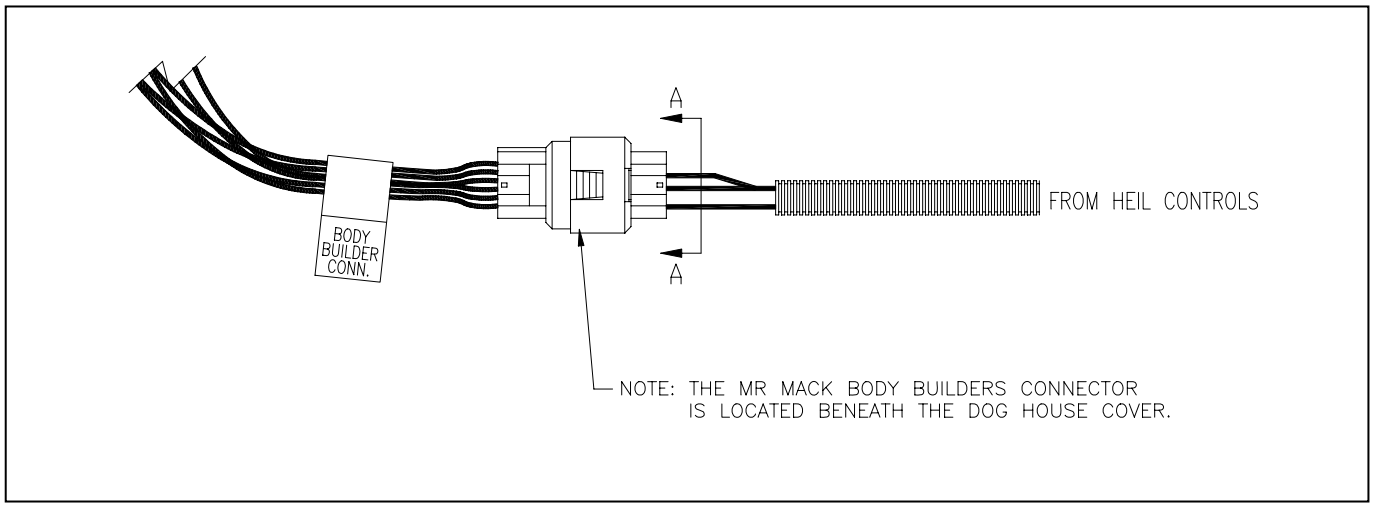
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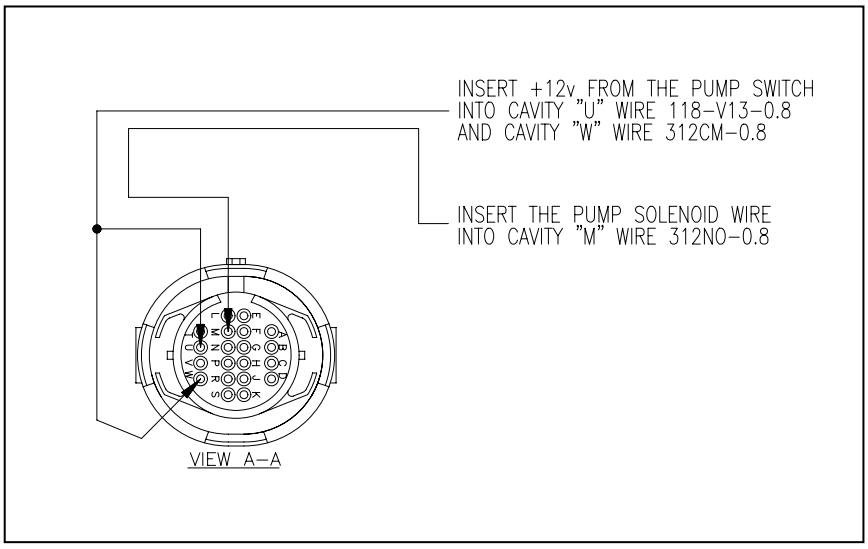
(EOS) ELECTRONIC OVERSPEED SWITCH KIT for ALLISON WORLD TRANSMISSION and 24v DC 272-7738-124



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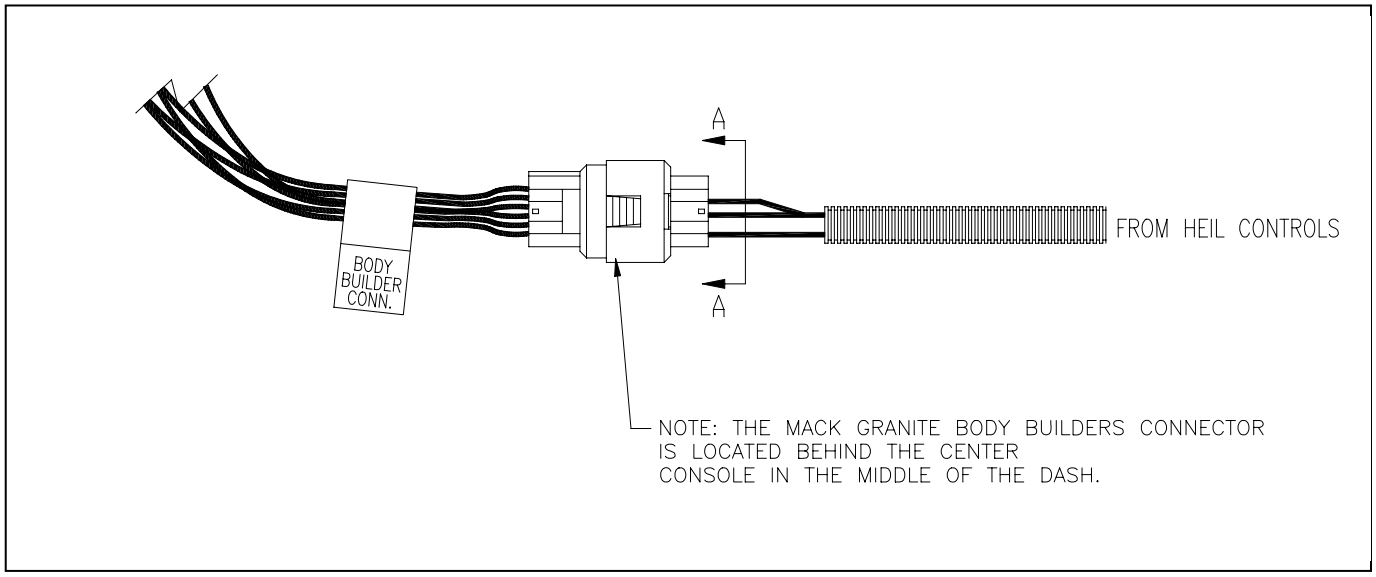
ELECTRONIC OVERSPEED KIT for MACK MR CHASSIS
ALLISON WORLD TRANSMISSION
272-7738—011

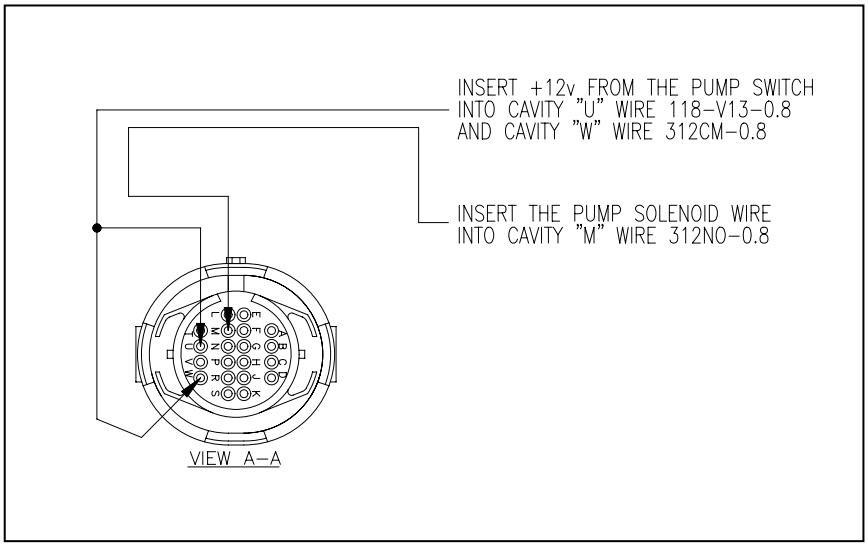




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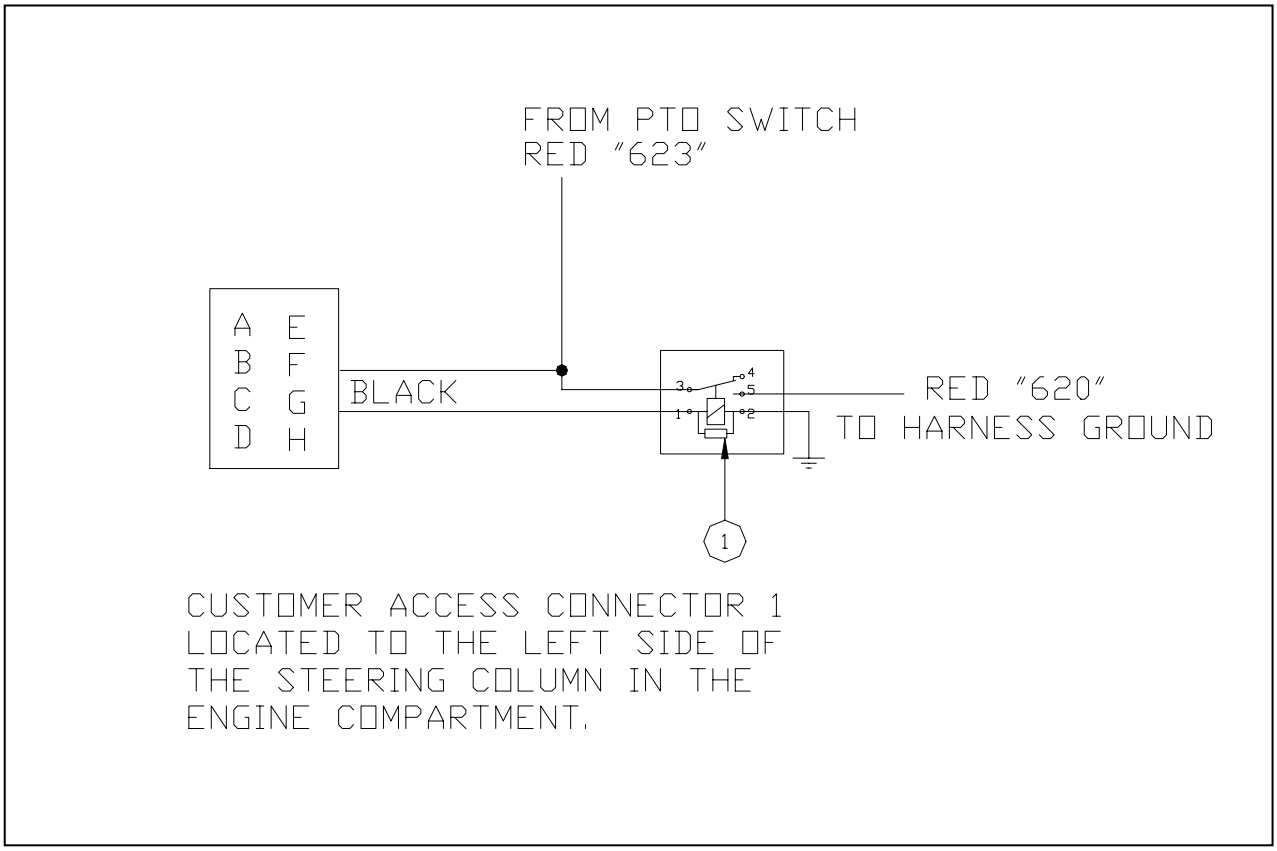
ELECTRONIC OVERSPEED KIT for MACK GRANITE CHASSIS
ALLISON WORLD TRANSMISSION
272-7738—014





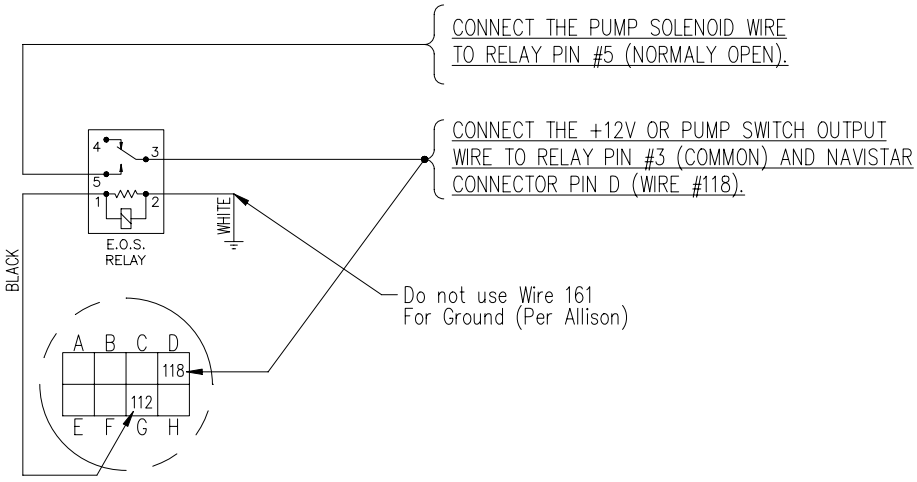
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ELECTRONIC OVERSPEED KIT with
ALLISON WORLD TRANSMISSION
272-7738—013



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ELECTRONIC OVERSPEED KIT for NAVISTAR NGV CHASSIS
ALLISON WORLD TRANSMISSION
272-7738—101

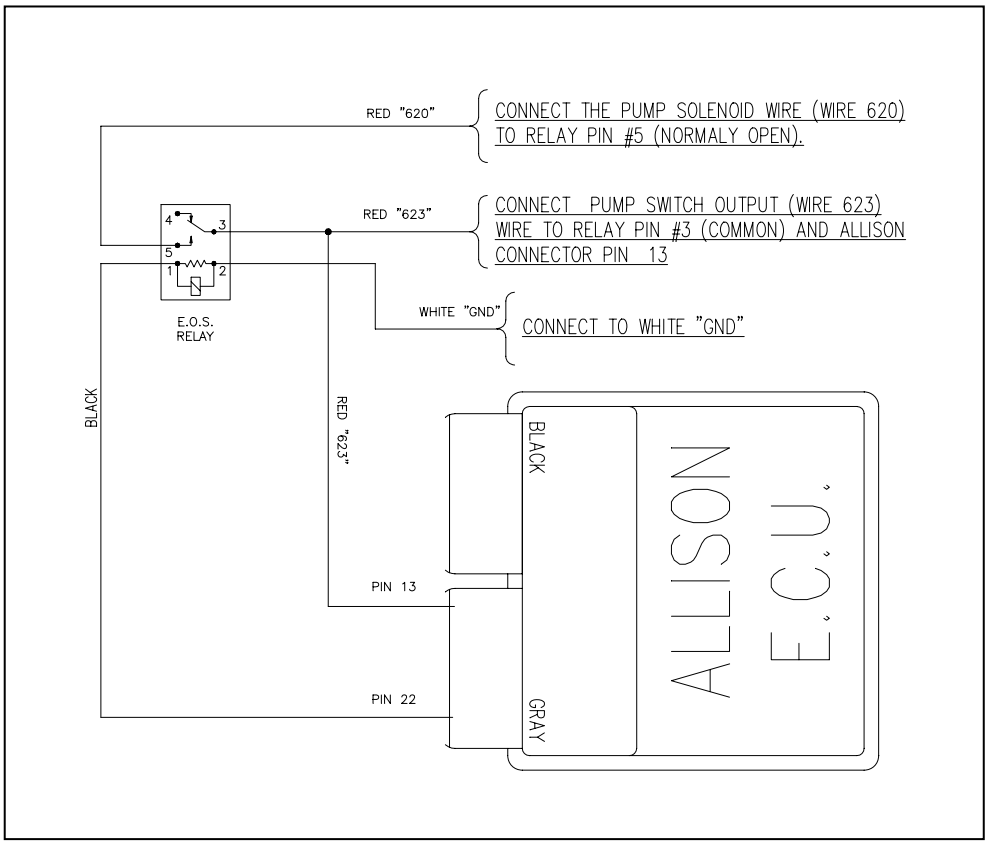


THE NGV CHASSIS HAS A 8 PIN (2 ROWS OF 4) CONNECTOR LOCATED TO THE RIGHT OF THE STEERING COLUMN TOWARD THE ENGINE. SPLICE INTO WIRES 114 AND 118 LEAVING THIS CONNECTOR AND RUN WIRES INTO THE CAB. INSTALL THE RELAY AND ASSOCIATED WIRING IN THE CAB.

PROGRAMMING PARAMETERS FOR WT TRANS. E.O.S.		
EQUIPMENT REQUIRED – PC W/ALLISON PC DOC SOFTWARE		
ENABLE/DISABLE WIRE 112	=	ENABLE
MAX. ENGINE SPEED FOR PTO ENGAGEMENT	=	900 RPM
MAX. ENGINE SPEED FOR PTO OPERATION	=	**** RPM
MAX. OUTPUT SPEED FOR PTO ENGAGEMENT	=	5000 RPM
MAX. OUTPUT SPEED FOR PTO OPERATION	=	5000 RPM
*** = THROTTLE ADVANCE + 200 RPM (NOT EXCEED 1800 RPM WITHOUT ENGINEERING APPROVAL)		

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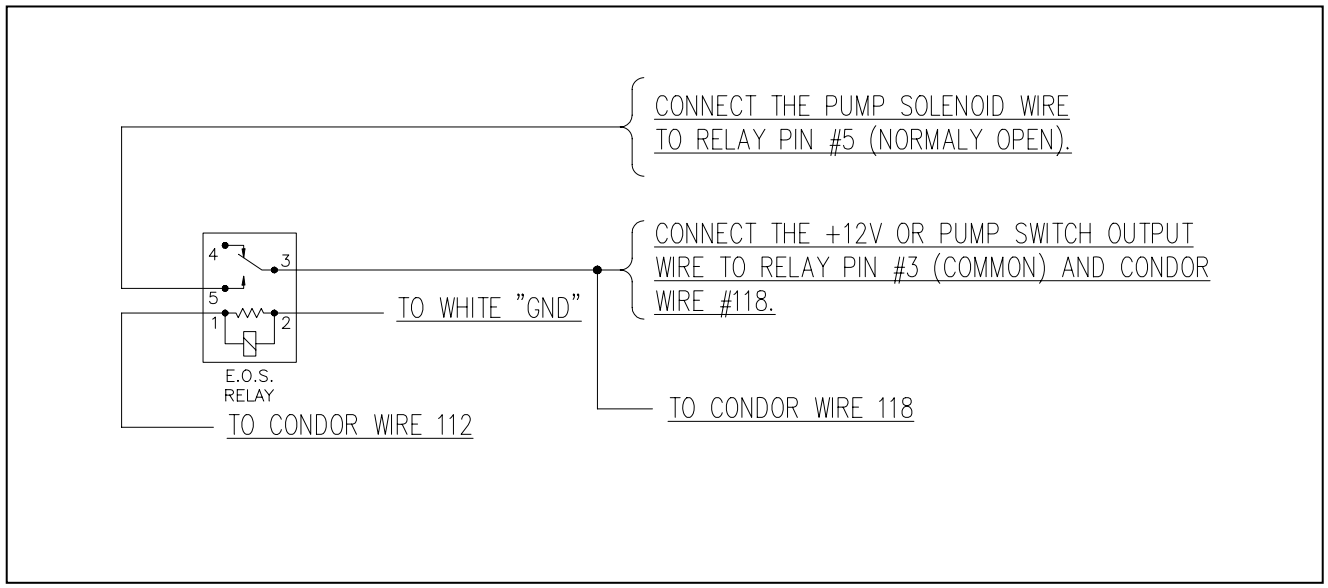
ELECTRONIC OVERSPEED KIT for FREIGHTLINER CHASSIS with ALLISON WORLD TRANSMISSION
272-7738—102



PROGRAMMING PARAMETERS FOR WT TRANS. E.O.S.		
EQUIPMENT REQUIRED – PC W/ALLISON PC DOC SOFTWARE		
ENABLE/DISABLE WIRE 112	=	ENABLE
MAX. ENGINE SPEED FOR PTO ENGAGEMENT	=	900 RPM
MAX. ENGINE SPEED FOR PTO OPERATION	=	**** RPM
MAX. OUTPUT SPEED FOR PTO ENGAGEMENT	=	5000 RPM
MAX. OUTPUT SPEED FOR PTO OPERATION	=	5000 RPM
*** = THROTTLE ADVANCE + 200 RPM (NOT EXCEED 1800 RPM WITHOUT ENGINEERING APPROVAL)		

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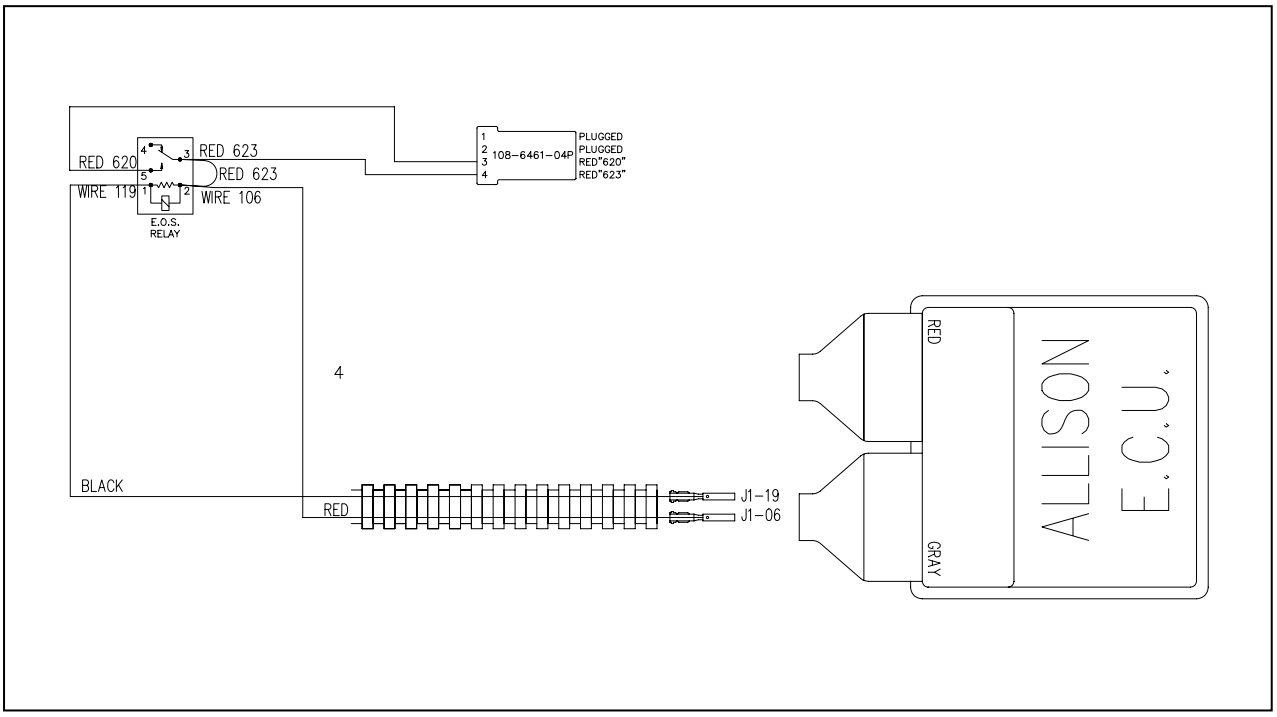
ELECTRONIC OVERSPEED KIT for CONDOR CHASSIS
ALLISON WORLD TRANSMISSION
272-7738—103



PROGRAMMING PARAMETERS FOR WT TRANS. E.O.S.		
EQUIPMENT REQUIRED – PC W/ALLISON PC DOC SOFTWARE		
ENABLE/DISABLE WIRE 112	=	ENABLE
MAX. ENGINE SPEED FOR PTO ENGAGEMENT	=	900 RPM
MAX. ENGINE SPEED FOR PTO OPERATION	=	**** RPM
MAX. OUTPUT SPEED FOR PTO ENGAGEMENT	=	5000 RPM
MAX. OUTPUT SPEED FOR PTO OPERATION	=	5000 RPM
*** = THROTTLE ADVANCE + 200 RPM (NOT EXCEED 1800 RPM WITHOUT ENGINEERING APPROVAL)		

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ELECTRONIC OVERSPEED KIT for GENERAL 1000, 2000 RDS CHASSIS with ALLISON WORLD TRANSMISSION
272-7738—105



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DuraPack® 5000



SERVICE MANUAL

SECTION 5
BODY

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SMS5-SWS-706075-0110

Customer Support

Heil Environmental ▪ 4301 Gault Ave. North . Fort Payne, AL 35967-9984 · 866.275.4345

SECTION 5 – BODY

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 Preventive Maintenance Chart 5.5
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Ejector Unload Valve 5.15
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Hydraulic Schematic 701-8426
Packer Hydraulic Flow Diagrams;
 Packer Retract/Extend 701-8426-1
Pneumatic (air) System;
 Air Supply Kits (272-7464) 5.19

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NOMENCLATURE



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SPECIFICATIONS

Hydraulic Oil Tank	40.6 Gal.
Hydraulic Oil System Capacity;	
18, 20, 25 yd. body	Approx. 50.6 Gal.
32 yd body	Gal.
Hydraulic In-Tank Oil Filter	3-Micron
Hydraulic Tank Suction Strainer	100 Mesh Screen
Hydraulic Cylinders:	
Ejector;	
18 yd	4 Stages 6” Bore x 97.5” Stroke
20 yd	4 Stages 6” Bore x 107.2” Stroke
25 yd	4 Stages 6” Bore x 136.1” Stroke
27 yd	4 Stages 6” Bore x 147.8” Stroke
32 yd	5 Stages 7” Bore x 173.6” Stroke
Hydraulic Pump (gear type)	27 GPM @ 1000 RPM @ 2500 PSI
Main System Relief Valve Pressure	2500 +/- 50 PSI
Ejector Relief Valve;	
Pump Pressure Relief (Valve “B”)	2100 +/-50 PSI
Outside Cylinder Rod End Relief (Valve “C”)	2350 +/-50 PSI
Ejector Extend Cycle Times;	
18 yd body	19 Seconds
20 yd body	22 Seconds
25 yd body	27 Seconds
27 yd body	Seconds
32 yd body	36 Seconds
Body Capacities	18 Cu. Yd.
	20 Cu. Yd.
	25 Cu. Yd.
	27 Cu. Yd.
	32 Cu. Yd.

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REAR LOADER

PREVENTIVE MAINTENANCE CHART

MAINTENANCE INTERVALS*

REF	COMPONENT/SYSTEM	Daily-8 Hours	Weekly-40 Hours	2 Months-400 Hours	12 Months-2000 Hours	SERVICE/CHECK
1	Hydraulic System	X				Check oil level – add if necessary
			X			Check cylinders, pump and system for leaks; repair/replace if necessary.
			X			Check control valve seals for leaks; repair/replace if necessary.
		See note below				*Replace filter element.
						Replace tank filter/breather.
					X	Drain, flush and refill, change filter element.
2	Lights & Wiring	X				Check for proper operation.
3	Operator's Control	X				Check for proper operation.
4	Front Mount Pump or Power Take-Off		X			Check seals for leaks and operation.
			X			Check drive line for smooth operation. Check set screws for tightness and that keys are in place.
5	Grease Fittings		X			Lubricate (see lube chart).
6	Control Linkage		X			Check and make sure all cotter pins are in place.
7	Packing Mechanism, Tailgate and Body	X				Check and remove any accumulation of refuse in front of ejector panel.
			X			Check tailgate seal for damage or missing gasket. Replace seal, if necessary.
			X			Check pivot pins and retaining capscrews for tightness.
8	Throttle Stop Device				X	Check and adjust if necessary.
9	Winch (Optional)			X		Check oil level, add gear oil if necessary.

*Replace filter after first 30 days of operation, then every 6 months or 1000 hours or when indicated by filter monitor light (located in cab). Also change tank breather/filter every time filter element is changed.

NOTE 1: Units equipped with container or winch mechanism. When a newly installed wire rope has been in operation for an hour, all nuts on clip bolts must be re-tightened and checked for tightness at frequent intervals thereafter.

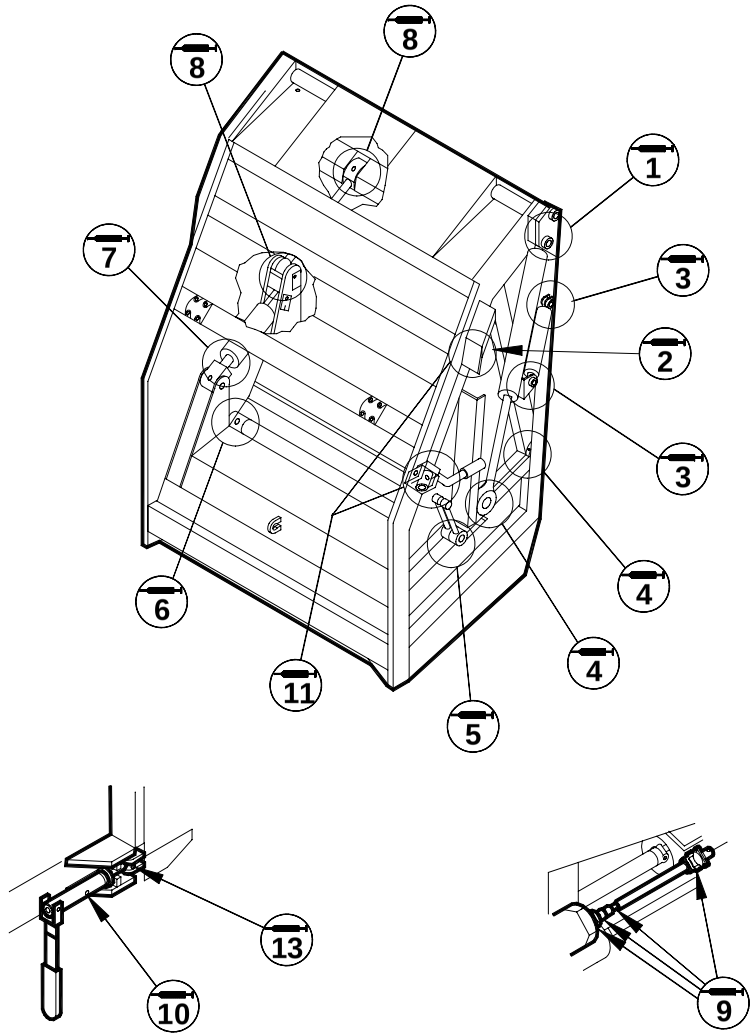
NOTE 2: Every month (200 Hours), unbolt the pump 4-bolt flange, move away approx. 2 inches from the PTO and apply grease to the female pilot of the PTO pump flange. This acts as a barrier to prevent moisture from getting into the pump and PTO engagement area. If the pump shaft and PTO are not greased as recommended, damage to the pump shaft may occur.

***Normal maintenance done according to an established schedule is preventive maintenance. On this equipment, this involves machine lubrication and normal maintenance intervals given in this manual are based on an 8-hour day and average operating conditions. Severe use or adverse conditions make it necessary to do this maintenance more frequently.**

Formula 5000 Lubrication Guide

Note: Use No. 1 pressure gun grease. Clean fittings before applying grease and always pump enough grease into joint to remove the old grease. Wipe off excess.

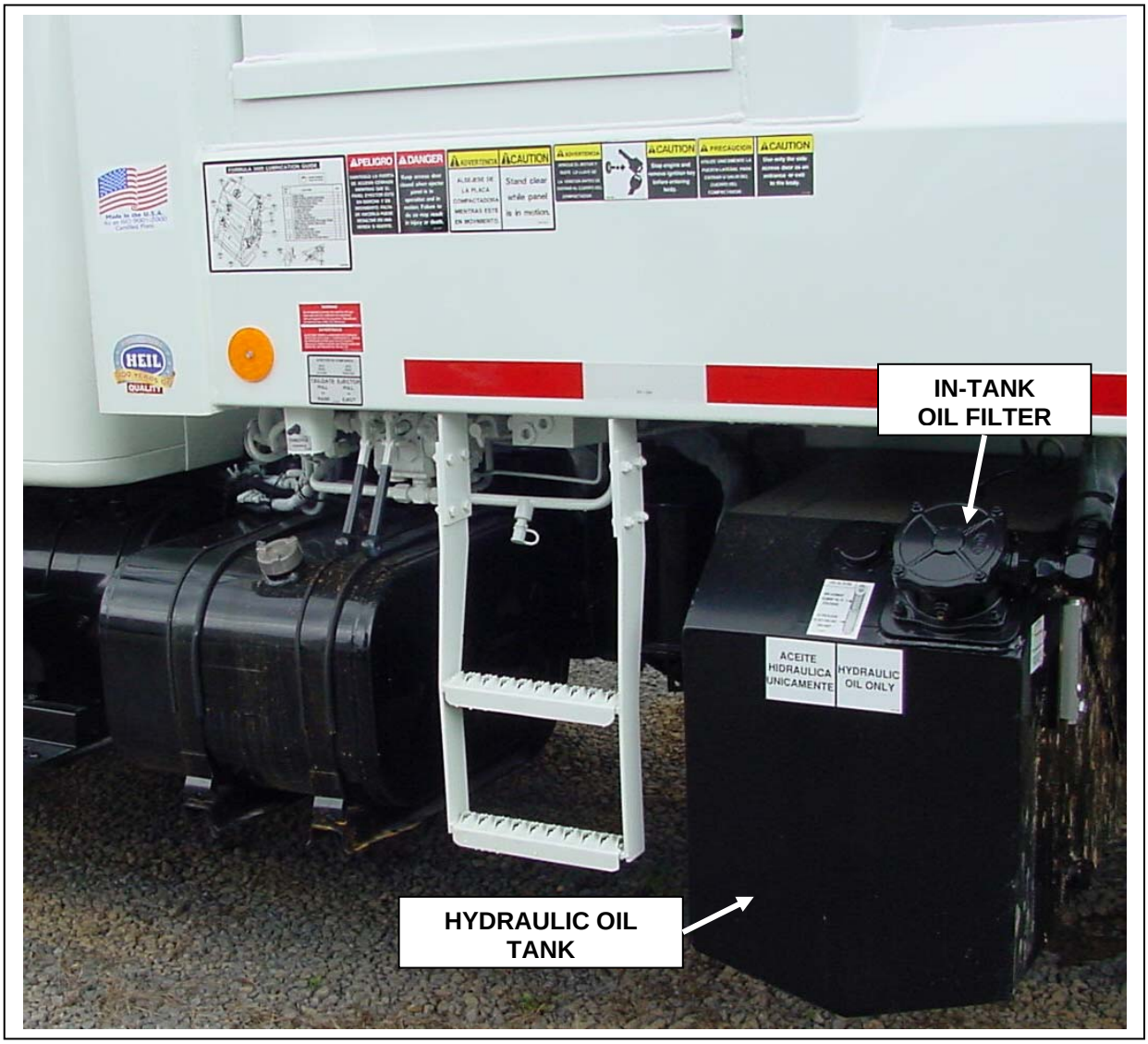
REF. NO.	LOCATION	QTY.	INTERVAL
1	Tailgate Hinge	2	Weekly/40 Hours
2	Outside Packing Cylinder (Both Ends)	4	Weekly/40 Hours
3	Tailgate Raise Cylinder (Both Ends)	4	Weekly/40 Hours
4	Lower Link Pivot (Both Ends)	4	Weekly/40 Hours
5	Control Handles/Linkage:		Weekly/40 Hours
	A. Upper Bellcranks	2	
	B. Kick-Out Lever	1	
	C. Lower Yoke Ass'y	2	
	D. Control Handle Pivots	2	
6	Packer Panel Pivot (Bottle Pin to Upper Panel)	4	Weekly/40 Hours
7	Inside Packing Cylinder (Both Ends)	4	Weekly/40 Hours
8	Upper Link Arms	4	Weekly/40 Hours
9	PTO (Pump) Drive Shaft	4	Weekly/40 Hours
	Front Mount Drive Shaft	3	Weekly/40 Hours
10	Tailgate Turnbuckle Clamps	2	Weekly/40 Hours
11	Container Mech. Control		
	A. Handle	1	Weekly/40 Hours
	B. Upper Pivot	1	Weekly/40 Hours
12	Ejector Cylinder (Not Shown)	1	Weekly/40 Hours
13	Tailgate Eye Bolts		Weekly/40 Hours
14	Access Door Hinges (Not Shown)		Weekly/40 Hours



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LOCATION OF HYDRAULIC OIL TANK with IN-TANK OIL FILTER

In most cases, the hydraulic oil tank with in tank filter is located on the left (streetside) of the unit and mounted to the chassis. In some optional cases, the tank in mounted above the front head of the body.



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OIL LEVEL CHECKING PROCEDURE

Check the oil level daily or every 8 hours, whichever comes first.

IMPORTANT!

Contamination is the worst enemy of any hydraulic system. Keep dirt from entering the system. Clean around any system component before disconnecting or removing it. When filling the tank, filter the oil through a 200 mesh (or finer) screen. NEVER use a cloth to filter the oil.

HYDRAULIC OIL TANK

Before checking the oil level, make sure the unit is in the following position:

1. **Chassis** – on level ground.
2. **Ejector panel** – at the front of the body.
3. **Tailgate** – is down and latched.
4. **Tailgate Packing Mechanism** – is in the starting position (Refer to operator's manual).

The oil level in the standard oil tank should be kept between the full and low marks as indicated on the decal by the sight gauge.

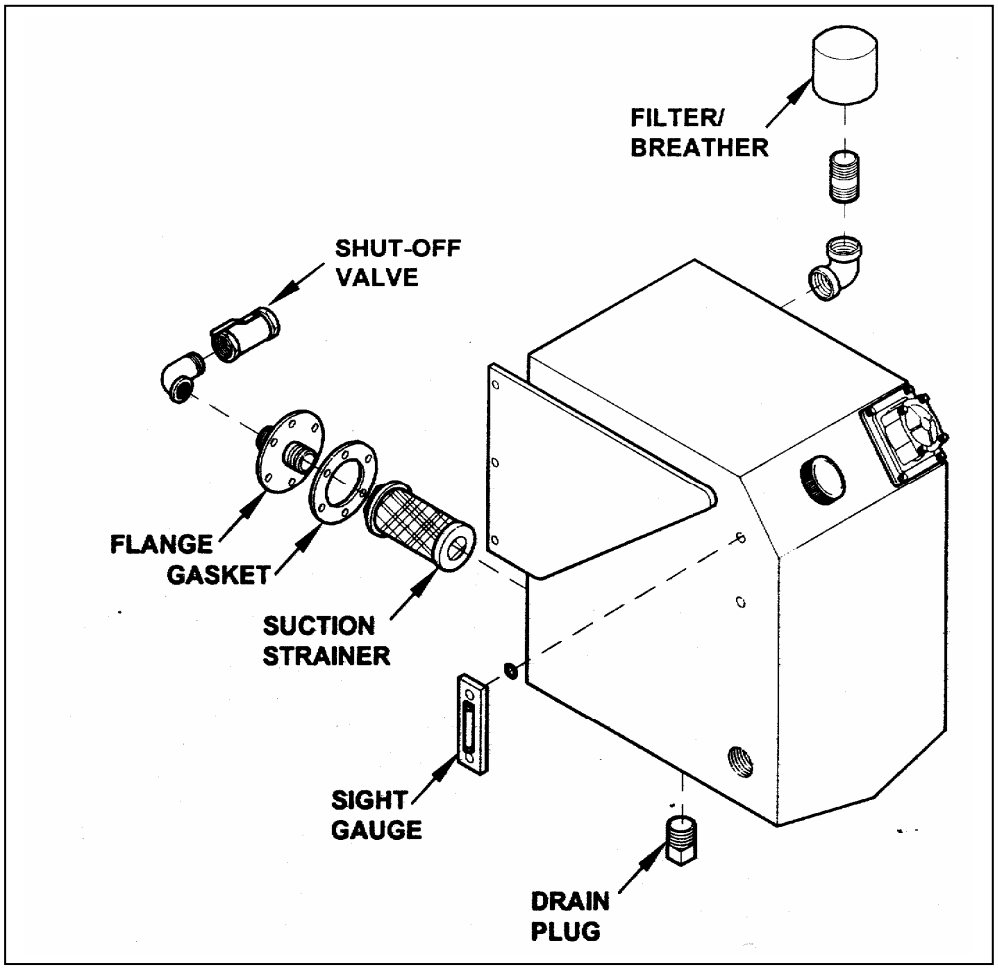
CHANGING THE FILTER ELEMENT

NOTE:

Change the filter more often under certain conditions, such as extremely dusty atmosphere or area. Use only HEIL replacement filters (075-0912-030), which may be ordered from your local Heil Distributor.

The element needs to be changed every 1000 hours or every 6 months or when indicated by the filter monitor light in the chassis cab.

See next page for filter breakdown.



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HYDRAULIC OIL FILTER – 3 MICRON

Change element as follows – (with unit in shutdown).

1. Remove nuts and cover.

2. Remove element (with by-pass assembly) and discard in a safe environmental way.

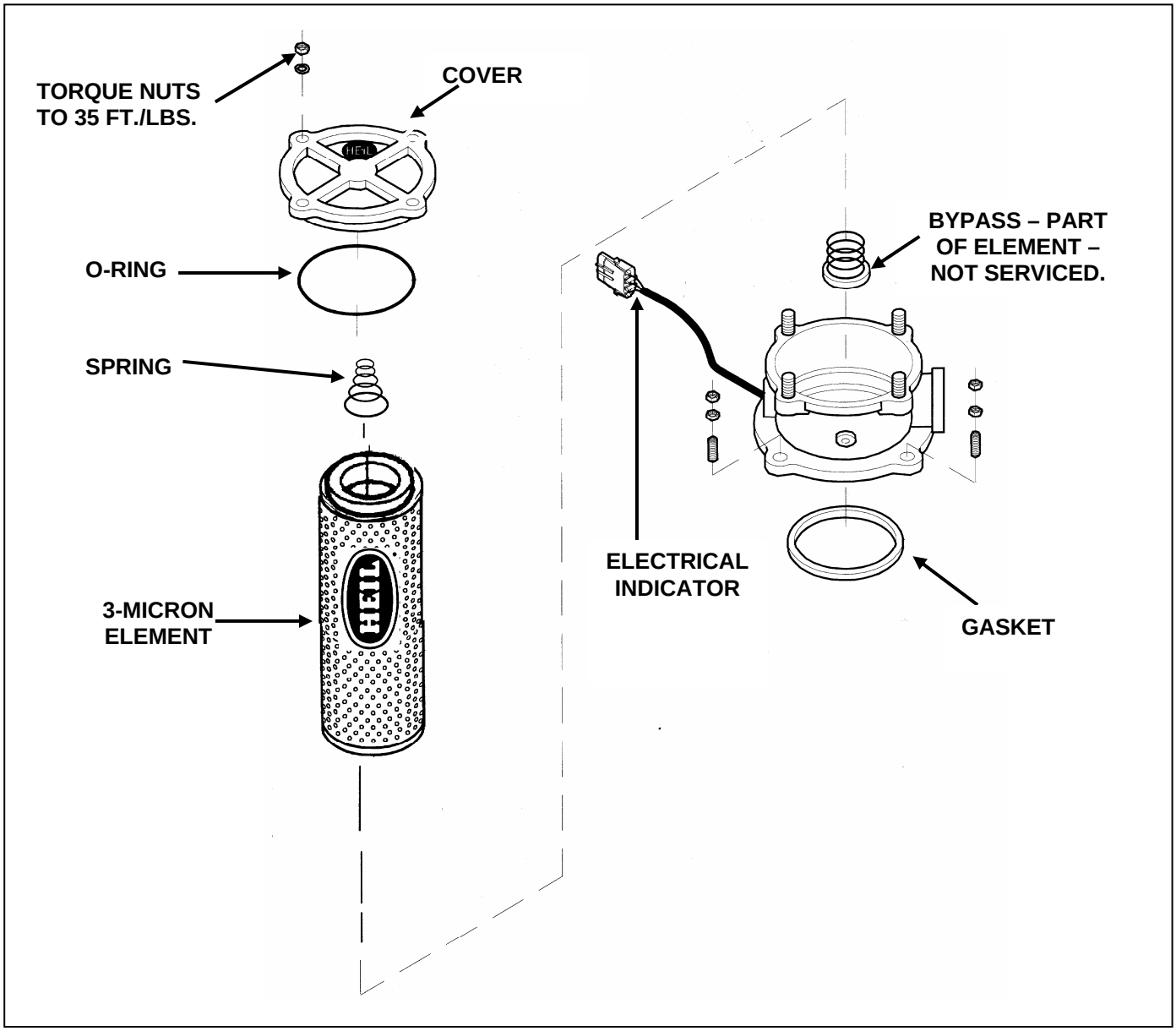
3. Clean housing with a lint free cloth.

4. Check o-ring and gasket and replace if necessary.

5. Lubricate all o-rings and gaskets.

7. Install new element.

8. Reinstall cover with nuts (torque nuts to 35 ft/lbs.).



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DRAINING AND CLEANING PROCEDURES

The hydraulic oil should be changed at least annually, or every 2000 hours of operating time, whichever comes first.

It must be remembered that almost all hydraulic system malfunctions can be traced to dirt in the fluid. When working with the hydraulic system, the hands, tools, working area and parts must be kept as clean as possible. Drain the hydraulic system fluid as follows:

⚠ DANGER

Hydraulic systems are highly pressurized. Escaping hydraulic oil, even an invisible pinhole leak, can penetrate body tissues causing serious injury. Use a piece of wood or cardboard when looking for leaks — never use the hands or other parts of the body.

Relieve hydraulic pressure before disconnecting circuits. When reassembling make absolutely certain all connections are tight.

If injured by hydraulic oil escaping under pressure, see a doctor immediately. Serious complications may arise if medical attention is not given at once.

1. Disengage the pump, shut off the engine and remove the ignition key.

2. Remove the fill cap from the top of the tank and then the drain plug from the bottom of the tank.

3. While fluid is draining from the tank, remove and replace the filter/breather assembly. This should be changed every time the in-tank filter is replaced.

4. The easiest and most effective way to drain the entire hydraulic system is to disconnect all hoses at the adapter and allow oil to drain into a suitable container.

5. Remove and replace the in-tank filter as described under "Changing the Filter Element".

6. Remove the outlet flange and 100 mesh suction strainer to gain access to the inside of the tank. Remove sediment from bottom of the tank.

7. Install the outlet flange with a new gasket and the 100 mesh suction strainer into the tank. Install the drain plug into the bottom of tank.

8. Reconnect and tighten all hose connections that were disconnected.

9. Fill tank with recommended oil checking the sight gauge (Refer to "Oil Level Checking Procedure").

NOTE: Before filling tank, make certain the funnel is clean and a 200 mesh (or finer) screen is used to strain the hydraulic oil.

10. Check the entire system to make sure all connections are tight and no leaks are found.

11. Start the truck's engine and engage the pump.

WARNING

Be sure all individuals are clear of any moving parts, mechanisms or components of the unit before actuating controls. During any such operation, be attentive at all times and be ready to stop or reverse the function.

12. Operate the packing mechanism through 10 cycles to be sure all air is removed from the circuits.

13. Operate the ejector panel through 3 complete cycles.

14. Operate the tailgate – full up and full down.

15. With the ejector panel in the retracted position and the tailgate packing mechanism in the start position, check the tank oil level. If necessary, add recommended oil as described in Section 1.

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TO PURGE THE HYDRAULIC SYSTEM

In the event the hydraulic system becomes contaminated due to component failure or other causes, the following procedure should be used to purge the system.

1. Extend the packer/ejector cylinder to lower the oil level in the tank.

2. Remove and replace the in-tank oil filter element in the tank.

3. Engage the packer/ejector control lever and allow the oil to circulate through the new filter, cleaning the oil.

IMPORTANT: Do not operate any other hydraulic component during this procedure.

4. Repeat the procedure as necessary until the system is purged.

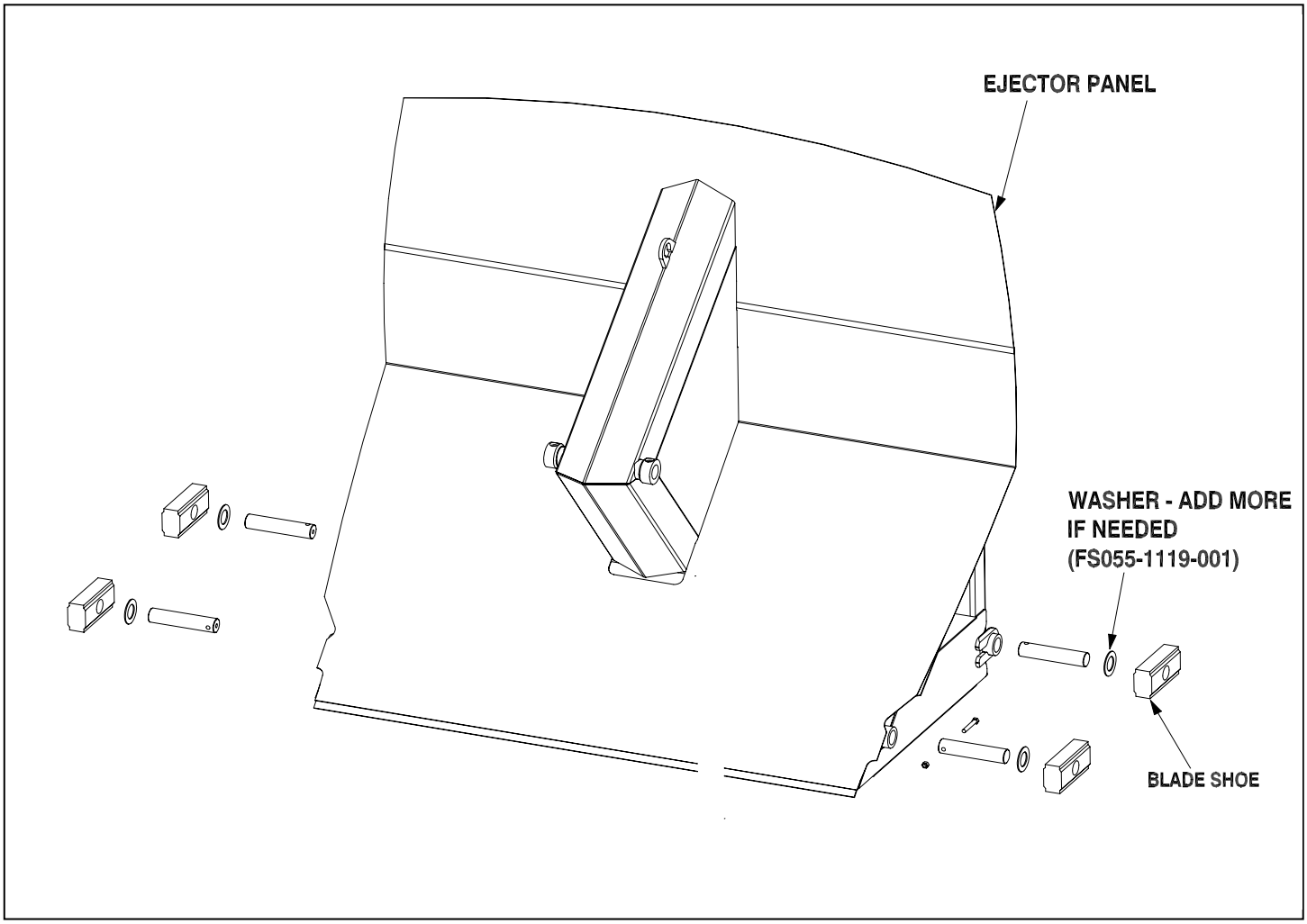
5. If more information is needed, contact the Heil field service department. If the contamination has reached the cylinders, a complete take-down may be necessary.

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EJECTOR SHOE ADJUSTMENT

If the ejector panel has excessive side to side movement and is binding or stalling in the body, it may be caused by the ejector shoes not being properly adjusted.

Washers (Part no. FS055-1119-001) are installed behind the wear shoes (see figure below). The clearance between the shoe and track should never exceed 1/4". The tighter the clearance, the less chance the ejector panel will turn and bind in the body.



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SIDE ACCESS DOOR

A hinged access door is located on the street side of the unit and provides access to the body area for cleanout purposes. **It should never be entered unless the truck engine is stopped and the ignition key removed and the unit is in lock-out/tag-out position.**

DANGER

Before entering the body area, place the unit in LOCK-OUT. To place unit in LOCK-OUT, stop the engine, set the brakes and make sure the brakes are holding and working properly, chock all wheels, remove the keys from the cab and insert a LOCK-OUT tag onto steering wheel.

DANGER

Keep access door closed when packer/ejector is in operation and in motion. Failure to do so may result in injury or death.

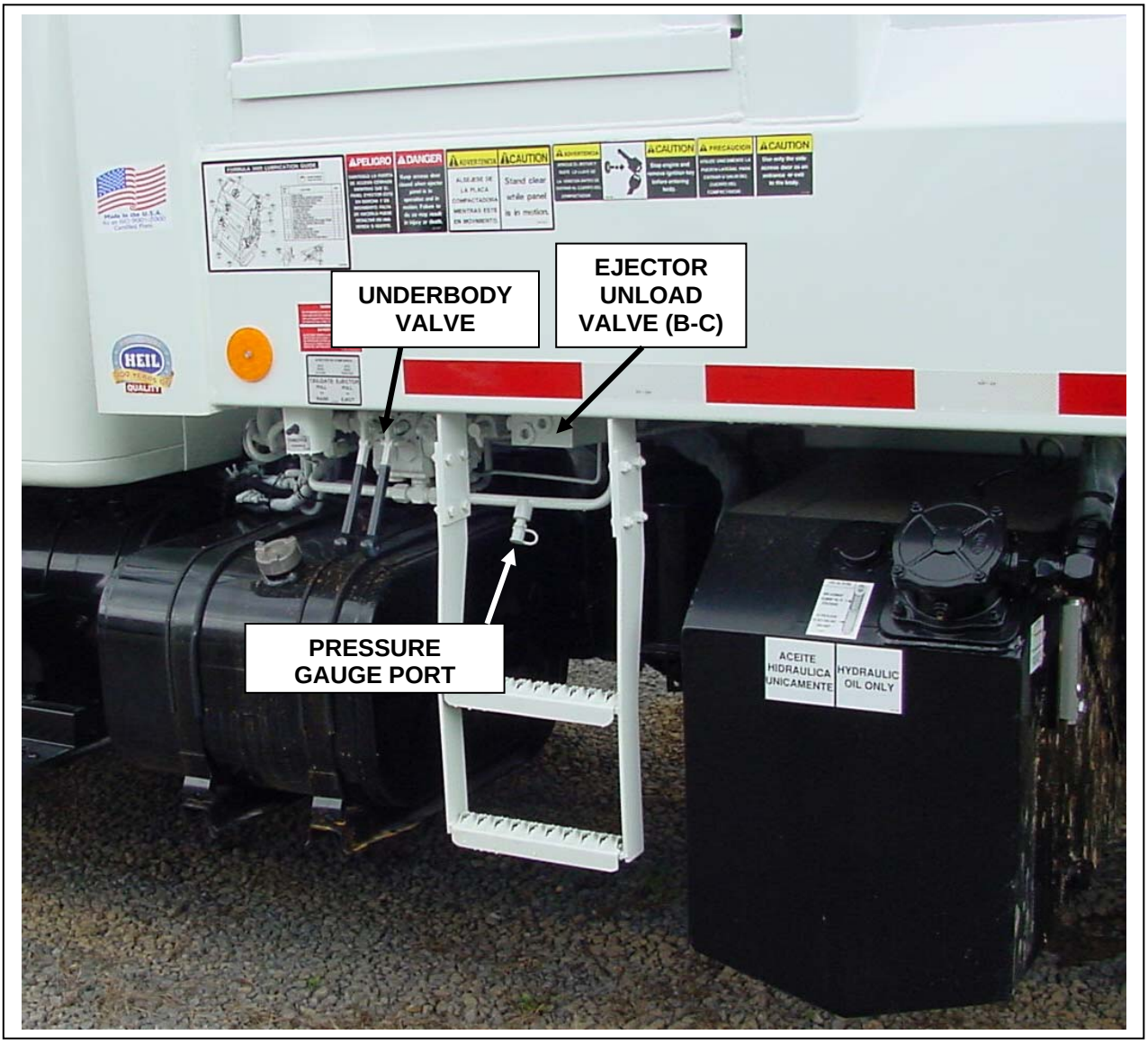


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UNDERBODY and EJECTOR UNLOAD VALVES

The underbody and ejector unload valves are located on the left (streetside) front corner of the body.

These valves control the ejector panel and tailgate raise/lower functions.



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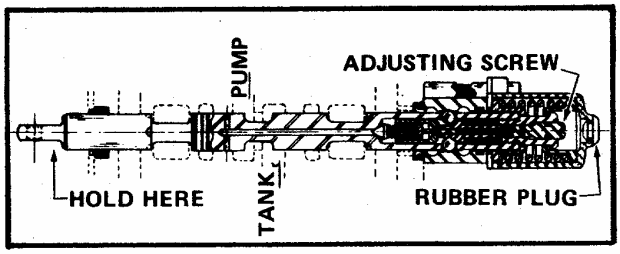
IMPORTANT: BE SURE AREA AROUND PACKING MECHANISM IS CLEAR OF ALL PEOPLE!

9. Engage the pump and turn throttle switch “on”.

10. With the throttle engaged, move blade control lever to shift spool in either direction.

11. Slowly turn main relief adjusting screw clockwise to increase pressure until spool of tailgate valve kicks out of detent (returns to neutral). The correct kickout pressure for the blade is 2400 PSI.

12. If setting is incorrect, remove the rubber plug from the end of the blade spool of tailgate valve to expose the detent release adjusting screw, see figure below.



DETENT ADJUSTMENT

13. To adjust, insert a flat tip screwdriver and turn adjusting screw in to the spool (clockwise) to increase the kickout pressure or turn adjusting screw out of the spool (counterclockwise) to decrease the pressure.

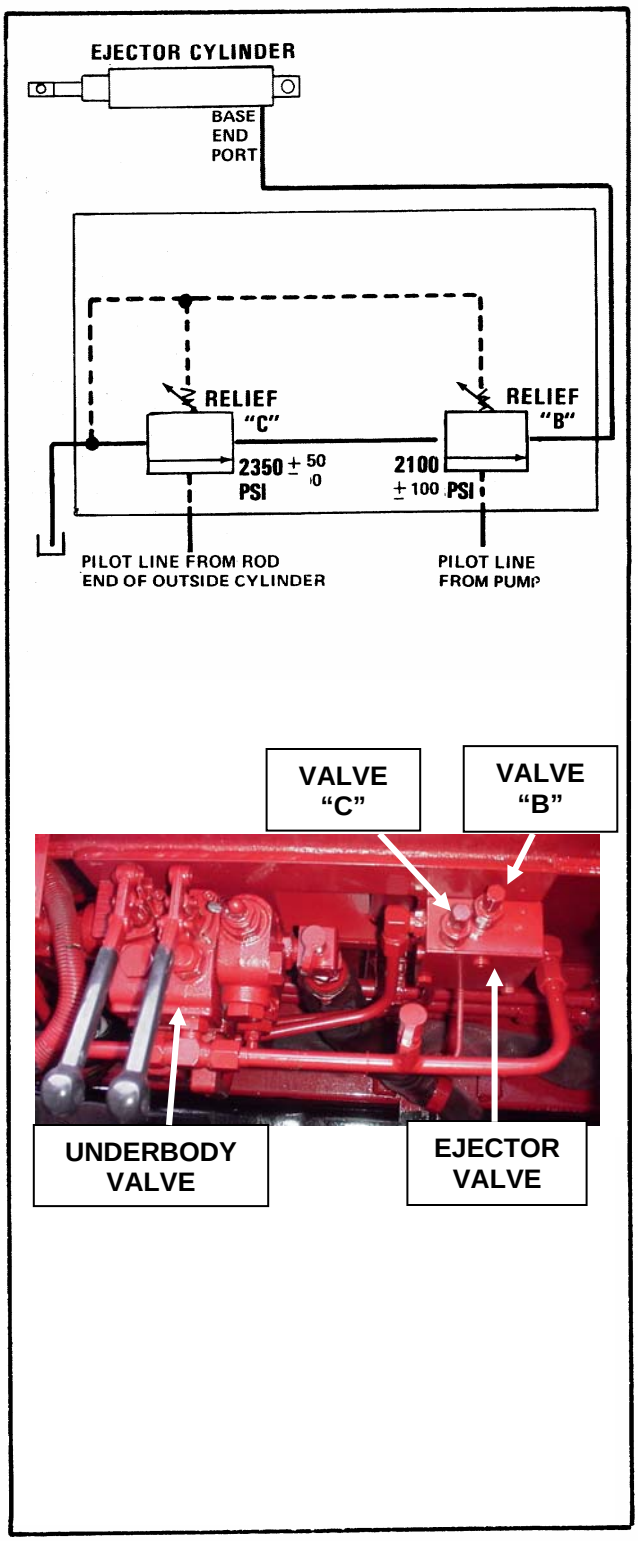
NOTE: Be careful not to force the adjusting screw or it may deform the internal adjusting rod and make the valve inoperative.

14. Repeat steps 8 thru 12 to verify the correct setting of 2400 PSI. Replace rubber plug to blade spool end.

B. EJECTOR UNLOAD VALVE (“B”/”C” valve)

The ejector unload valve is located next to the underbody valve (both sides of body).

There are two different adjustments that can be made on this valve.



EJECTOR UNLOAD RELIEF VALVES “B” & “C”

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1. ADJUSTMENT OF RELIEF VALVE "B"

8. Lock the tailgate clamps and pull tailgate raise control lever, reading the main system pressure gauge. Adjust main system down until the gauge reads 2100 PSI.

9. Remove plugs or caps covering relief valve "B" and "C" in the ejector unload valve, see figure 6.

10. Turn adjustment screw of Valve "C" out of body 2 full turns (counterclockwise).

11. Turn adjustment screw of Valve "B" into the body 2 full turns (clockwise).

12. Pull ejector cylinder control lever to extend cylinder full out and momentarily bottom cylinder. Release the lever.

13. Pressure is now trapped in the cylinder. Check pressure gauge in ejector line. It should read approximately 1800* PSI.

NOTE: If pressure does not hold, turn relief "B" adjusting screw in (clockwise) 1/2 turn and repeat steps 12 and 13.

14. Push the upper panel control lever and leave it in detented position, (upper panel cylinders bottomed in up position).

15. Observing both pressure gauges, slowly turn out (counterclockwise) on Relief "B" adjusting screw until Relief "B" reaches 2100 PSI, the ejector line pressure gauge will fall rapidly to 0 PSI. Relief "B" is now set at 2100 PSI.

NOTE: Manually shift the upper panel control lever to neutral.

2. ADJUSTMENT OF RELIEF VALVE "C"

NOTE: ALL ADJUSTMENTS MUST BE MADE WITH THROTTLE ADVANCE ENGAGED.

1. Lock tailgate clamps and pull tailgate raise control lever, reading the main system pressure gauge. Adjust main system pressure up until gauge reads 2350 PSI.

**1800 PSI is an approximate measurement to insure pressure is trapped in the ejector line when the ejector is extended and the body is empty.*
As long as the trapped pressure is maintained above 1000 PSI for one minute, the ejector blade resistance system will operate properly with no detrimental affect on payload.

2 Turn adjusting screw of Relief "C" in (clockwise) 2-1/2 turns.

3. Pull ejector cylinder control lever to extend cylinder full out and momentarily bottom cylinder. Release the lever.

4. Pressure is now trapped in the cylinder. Check pressure gauge in ejector line. It should read approximately 1800* PSI.

NOTE: If pressure does not hold, turn relief "C" adjusting screw in (clockwise) 1/2 turn and repeat steps 3 and 4.

5. Push the upper panel control lever and leave it in detented position, (upper panel cylinders bottomed in up position).

6. Observing both pressure gauges, slowly turn out (counterclockwise) on Relief "C" adjusting screw until Relief "C" reaches 2350 PSI, the ejector line pressure gauge will fall rapidly to 0 PSI. Relief "C" is now set at 2350 PSI.

NOTE: Manually shift the upper panel control lever to neutral.

7. Reinstall plugs or caps covering Reliefs "B" and "C".

8. Reconnect the top kick-out, reverse Step 5 in Relief "B" adjustment.

9. Follow procedures to readjust the main relief.

D. UNDERBODY VALVE – MAIN RELIEF

NOTE: ALL ADJUSTMENTS MUST BE MADE WITH THROTTLE ADVANCE ENGAGED.

NOTE: Hydraulic oil must be at or near operating temperature. If not, warm, see "Before Starting Adjustments" on page 9.15.

Remove dirt and grease around main relief.

1. Lock tailgate clamps and pull tailgate raise control lever.

2. Read system pressure gauge, it should read 2500 +50/-0 PSI.

3. Remove dome nut.

4. Loosen lock nut.

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5. Turn adjusting screw out of body (counterclockwise) to decrease the pressure or turn screw into body (clockwise) to increase the pressure.

6. When correct pressure is attained, tighten lock nut and reinstall nut.

7. Recheck the system pressure.

8. Remove pressure gauges from fittings.

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TROUBLESHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	REMEDY
Ejector Panel will not Relieve	Ejector relief set higher than main relief.	1. Raise Main Relief setting. 2. Lower ejector relief setting.
Ejector Panel moves Forward too much When packing.	Ejector relief set too low.	1. Lower main relief setting. 2. Raise ejector relief setting.
	Ejector relief valve stuck open.	1. Remove relief spool and clean. 2. Replace relief valve.
Ejector panel moves forward When other functions of packing cycle are in use.	Cylinder bottoms before manual Kick-out center spool.	1. Adjust top kick-out.
Inside cylinder sticks in blade (lower) panel up position.	Detent set higher than main relief.	1. Lower the lower panel detent setting.
Lower Panel will not tuck all The way (inside cylinders are Partially extended).	Lower panel detent setting too low.	1. Adjust lower panel detent setting Up.

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DISASSEMBLY/ASSEMBLY OF UNDERBODY VALVE SECTIONS

1. Mark each valve section numerically to avoid incorrect reassembly.
2. Remove three (3) assembly stud nuts (see Figure 14A) from the inlet section using a 9/16" thin wall socket.
3. Remove valve sections by sliding from assembly studs, see Figure 14A.
4. Remove and discard o-rings in each section. Thoroughly clean o-ring counterbores and ground surfaces of each section.
5. Replace the four o-rings in each section.
6. Replace valve sections on assembly studs in the same manner in which they were removed. O-ring counterbores should be to the left when facing "A" portend of the valve.

NOTE

USE CARE IN REPLACING VALVE SECTIONS TO AVOID DISLODGING O-RINGS FROM COUNTERBORES.

7. Reassemble three (3) stud nuts on stud assembly. Torque nuts evenly to 32 ft./lbs.

CAUTION

DO NOT USE LOCKWASHERS WITH STUD NUTS. IF STUD NUTS ARE NOT TIGHTENED TO THE PROPER TORQUE, VALVE SPOOLS MAY BIND OR STICK OR CAUSE SECTION SEALS TO EXTRUDE.

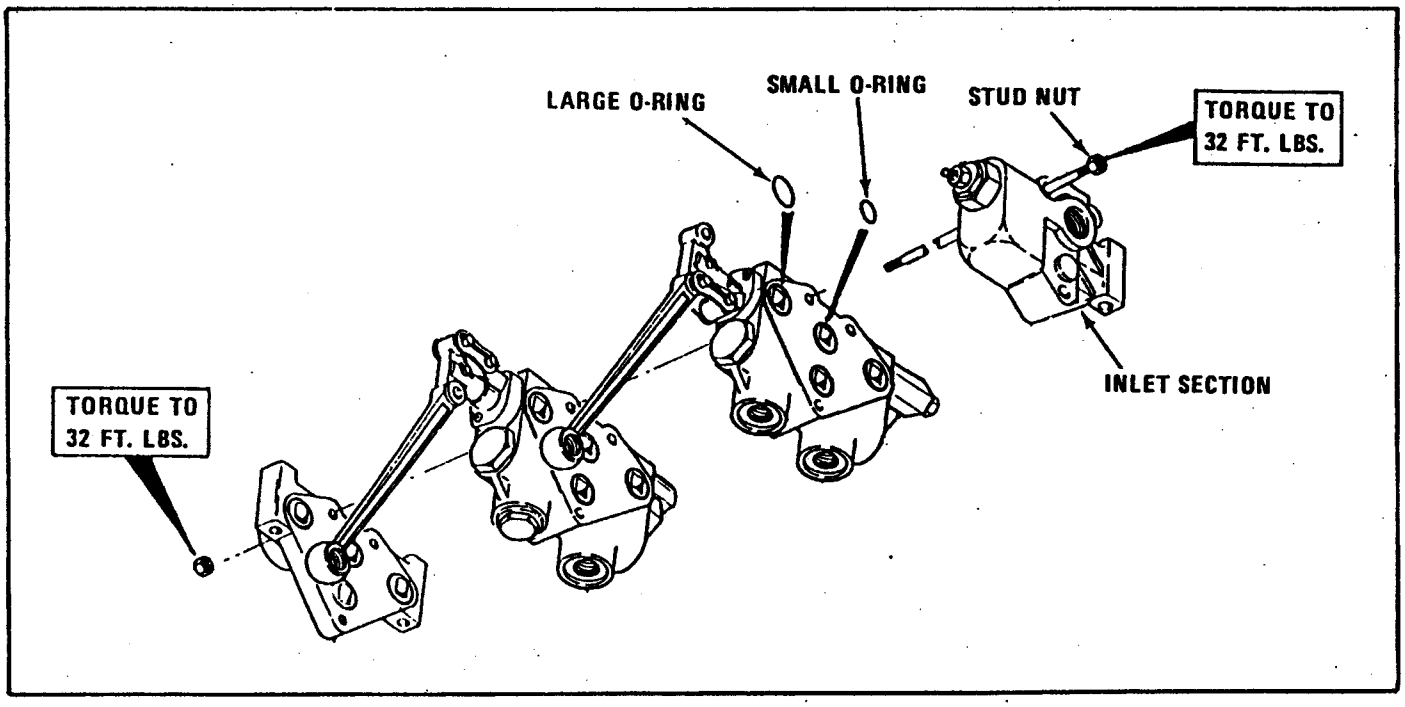


Figure 14a.

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REPLACING SPOOL SEALS

1. Remove bonnet assembly parts from back of valve section. Keep parts in order of dissassembly, see Figure 14B.

2. Remove complete handle assembly from spool on the front of valve section, see Figure 14B.

NOTE

DO NOT REMOVE spool as the seals can be replaced externally. Prevent spool from turning or moving by inserting a screw driver through clevis slot or running a rod through clevis slot and using a handle. DO NOT hold the spool with a wrench. This will destroy spool finish.

3. Remove retainer plate washer, back-up washer and spool seal, see Figure 14B.

4. Thoroughly clean counterbore.

5. Lightly oil new seal and slide over spool and insert in seal counterbore. Put washers back on spool and reassemble handle assembly. Torque screws evenly to 10 ft./lbs.

6. Reassemble bonnet assembly, making sure it goes together in same order as when removed.

7. Torque bonnet screws evenly to 10 ft./lbs.

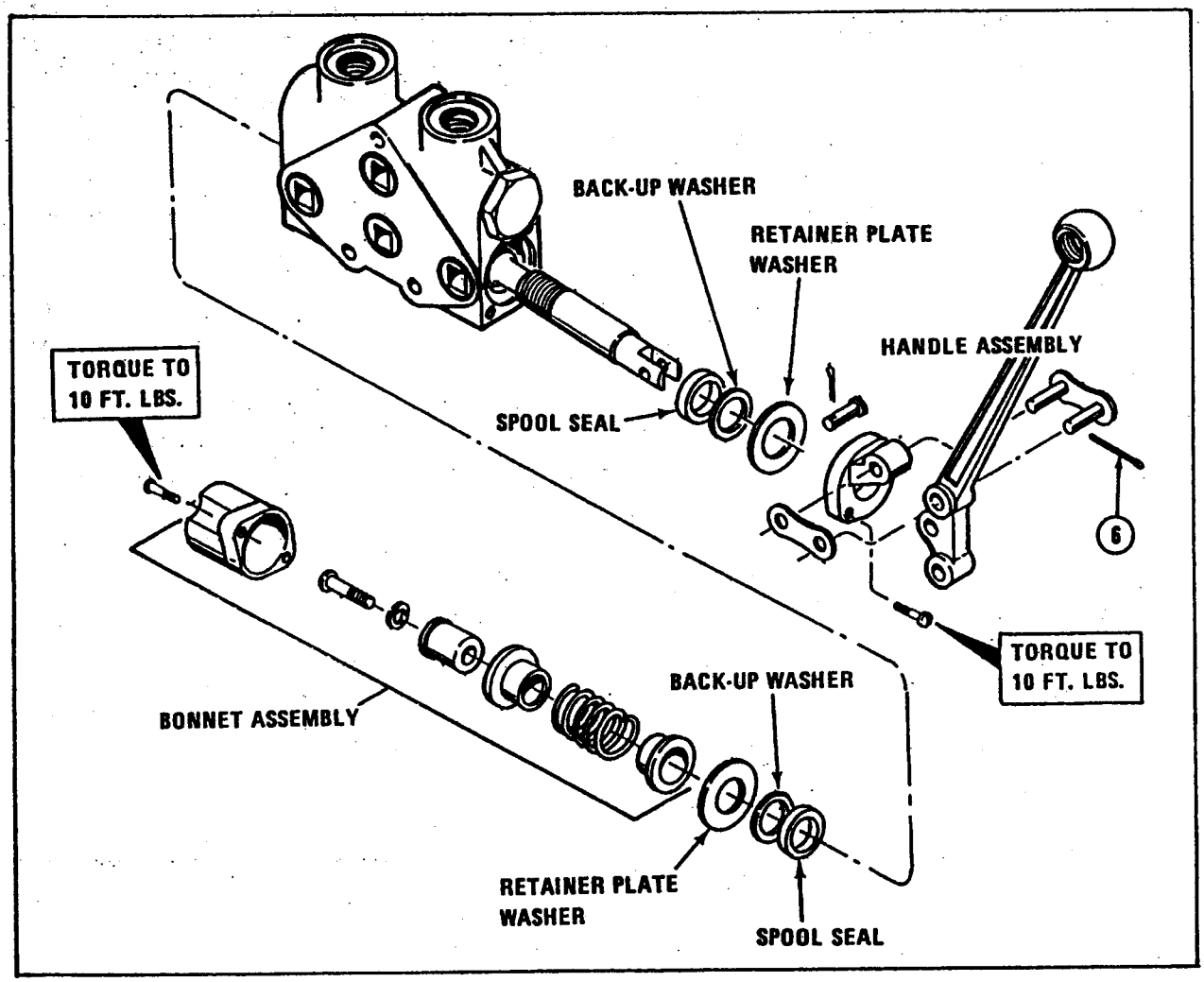
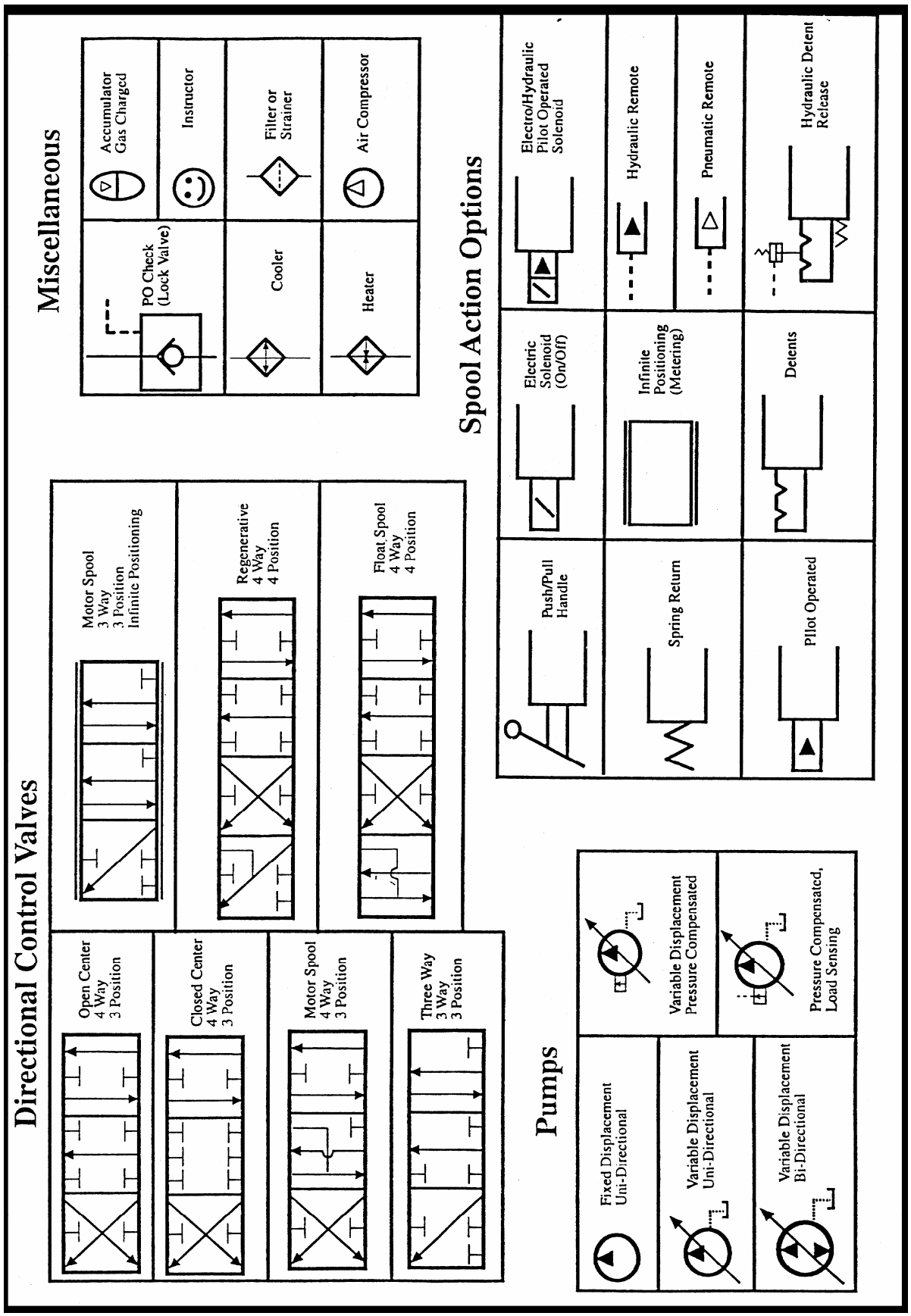


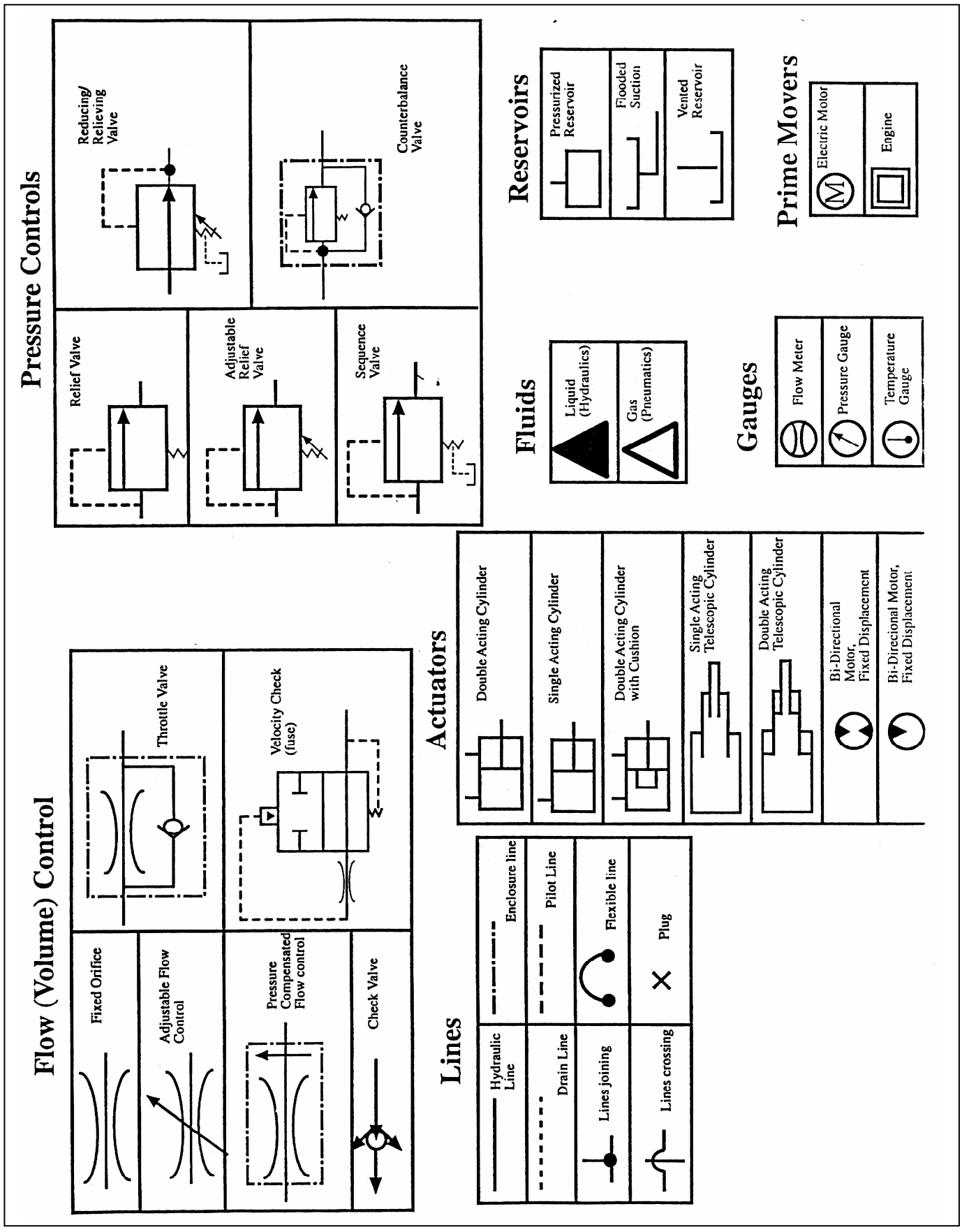
Figure 14b.

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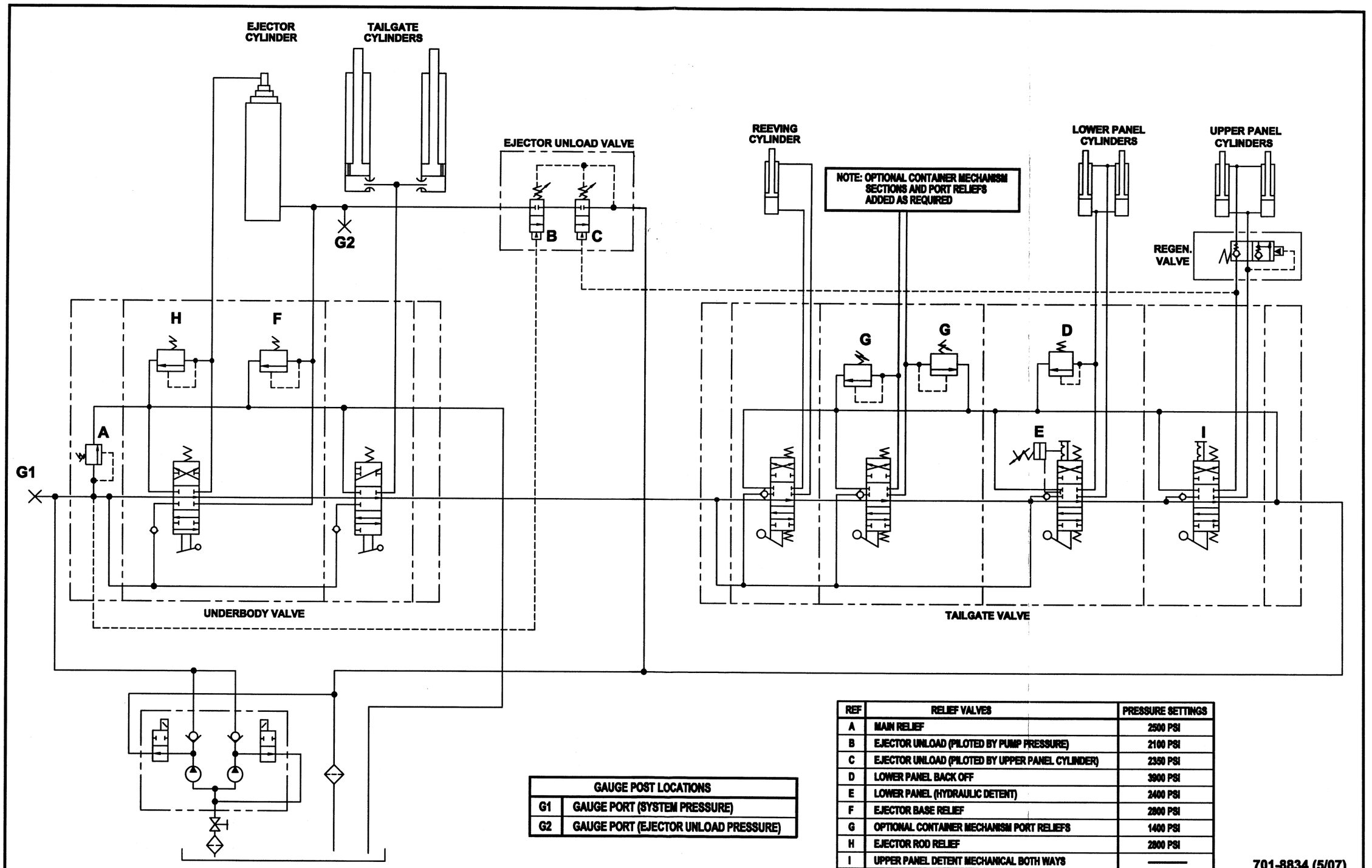
HYDRAULIC SYMBOLS



HYDRAULIC SYMBOLS



5000 HYDRAULIC SCHEMATIC - TANDEM DENISON PUMP

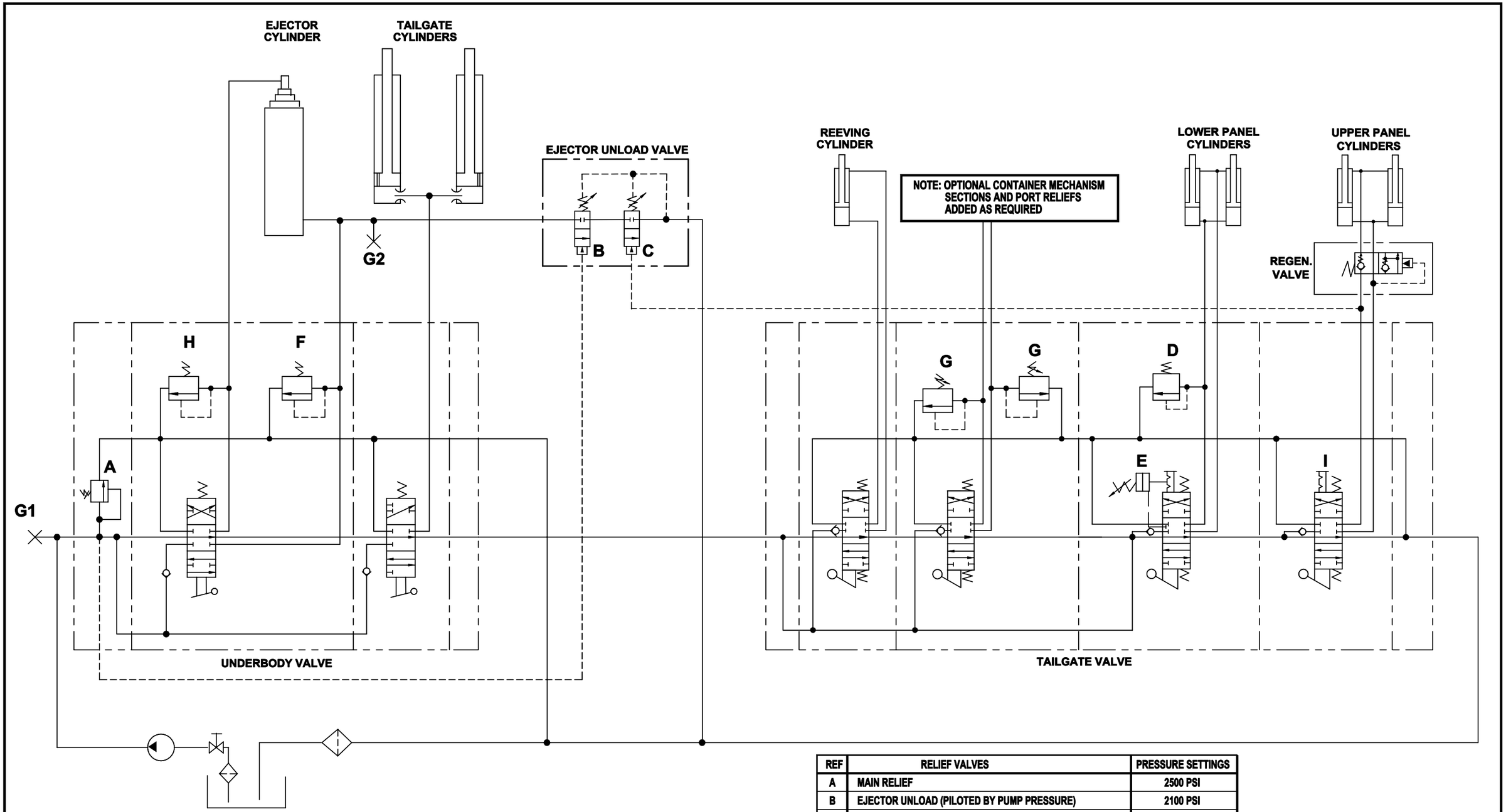


GAUGE POST LOCATIONS	
G1	GAUGE PORT (SYSTEM PRESSURE)
G2	GAUGE PORT (EJECTOR UNLOAD PRESSURE)

REF	RELIEF VALVES	PRESSURE SETTINGS
A	MAIN RELIEF	2500 PSI
B	EJECTOR UNLOAD (PILOTED BY PUMP PRESSURE)	2100 PSI
C	EJECTOR UNLOAD (PILOTED BY UPPER PANEL CYLINDER)	2350 PSI
D	LOWER PANEL BACK OFF	3900 PSI
E	LOWER PANEL (HYDRAULIC DETENT)	2400 PSI
F	EJECTOR BASE RELIEF	2800 PSI
G	OPTIONAL CONTAINER MECHANISM PORT RELIEFS	1400 PSI
H	EJECTOR ROD RELIEF	2800 PSI
I	UPPER PANEL DETENT MECHANICAL BOTH WAYS	———

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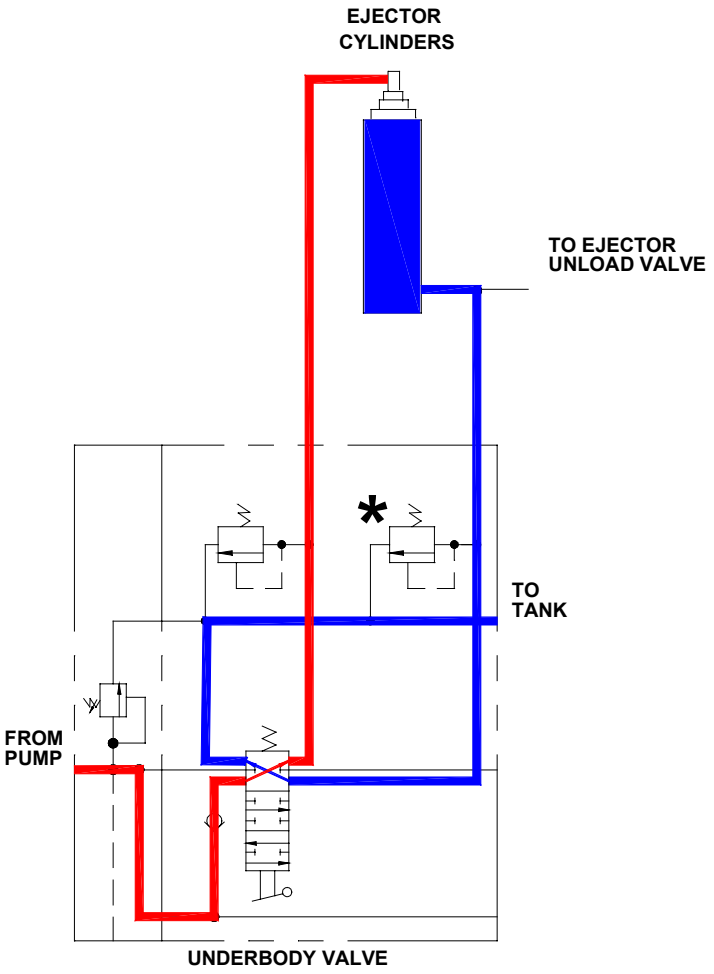
HYDRAULIC SCHEMATIC



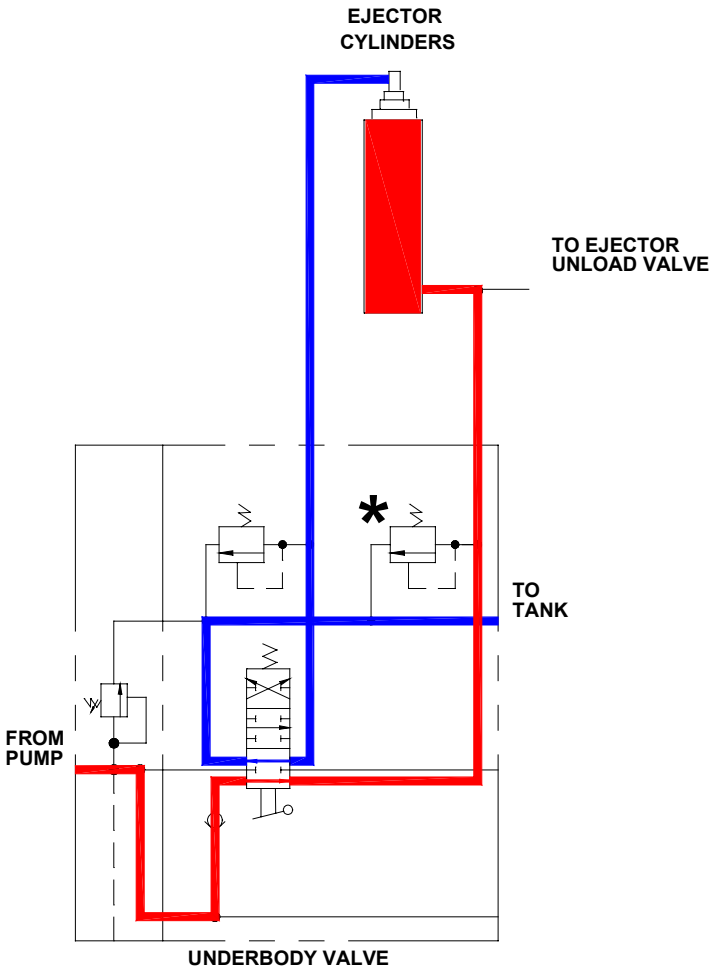
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E	LOWER PANEL (HYDRAULIC DETENT)	2400 PSI
F	EJECTOR BASE RELIEF	2800 PSI
G	OPTIONAL CONTAINER MECHANISM PORT RELIEFS	1400 PSI
H	EJECTOR ROD RELIEF	2800 PSI
I	UPPER PANEL DETENT MECHANICAL BOTH WAYS	----------

EJECTOR RETRACT



EJECTOR EXTEND



* USED ON 27 AND 32 YD. UNITS ONLY

LEGEND

= PUMP PRESSURE

= RETURN PRESSURE

701-8426-1

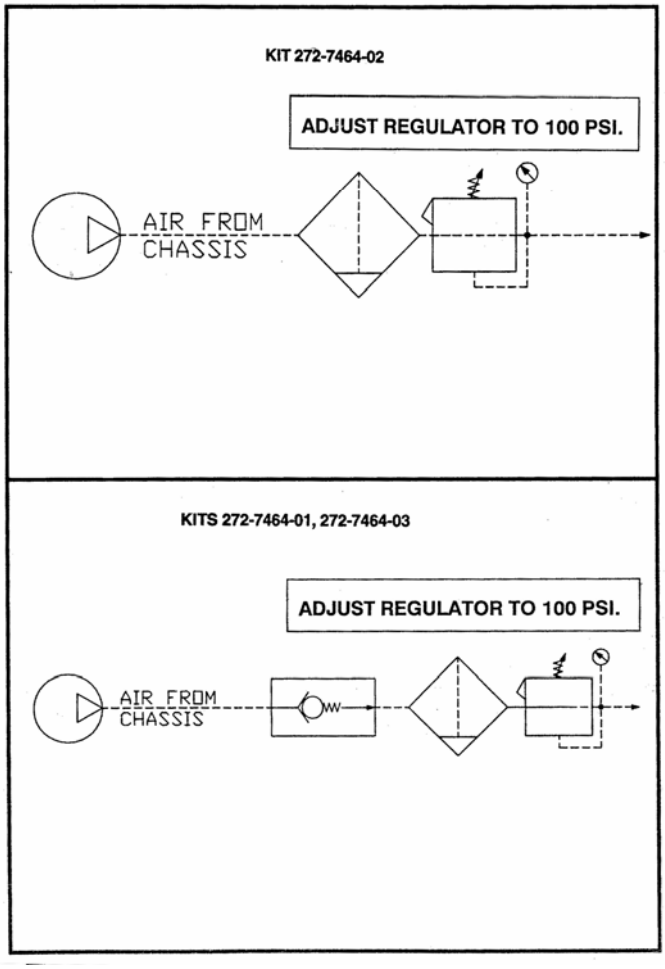
AIR SUPPLY KITS
PNEUMATIC DIAGRAMS
272-7464

AIR REGULATOR ADJUSTMENT KNOB. SET @ 100 PSI LIFT KNOB TO UNLOCK, PRESS KNOB TO LOCK



TRACTOR PROTECTION VALVE

AIR FILTER/ REGULATOR



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DuraPack® 5000



SERVICE MANUAL

SECTION 6
TAILGATE

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Customer Support

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SPECIFICATIONS

Hydraulic Cylinders:	
Blade (lower panel)	5-1/2” Bore x 24” Stroke
Upper Panel	5” Bore x 36” Stroke
Tailgate Raise	4” Bore x 24-1/2” Stroke
Container Arm	3” Bore x 18-7/16” Stroke
Roll Bar	2-1/2” Bore x 14-1/2” Stroke
Reeving	5-1/2” Bore x 49-3/4” Stroke
Tailgate Valve:	
Blade (Lower Panel) Detent	2400 PSI
Blade Back-Off Relief	3900 PSI
Optional Mechanism (Winch, Roll Bar)	1400 PSI
Tailgate Valve:	
Blade (Lower Panel) Detent	2400 +/-50 PSI
Blade Back-Off Relief	3900 +/-50 PSI
Optional Mechanism (Winch, Roll Bar)	1400 +/-50 PSI
Packer Mechanism Cycle Times (Empty Hopper);	
Complete Cycle – PTO Direct Mount without Driveline@ 27 GPM	*28 to 32 Seconds
Complete Cycle – Std. Front Mount or PTO Mount with Driveline@ 47 GPM	16 to 18 Seconds
Reload - PTO Direct Mount without Driveline@ 27 GPM	9 to 11 Seconds
Reload – Std. Front Mount or PTO Mount with Driveline@ 47 GPM	6 to 7 Seconds
Tailgate Cycle times;	
Raise	20 Seconds
Lower (use engine low idle only)	21 Seconds
Hopper Capacity	3.1 Cu. Yd.

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* It is acceptable to set the cycle time between 22-32 seconds when certain engine/PTO combinations prohibit meeting the 28 second minimum.

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NOMENCLATURE

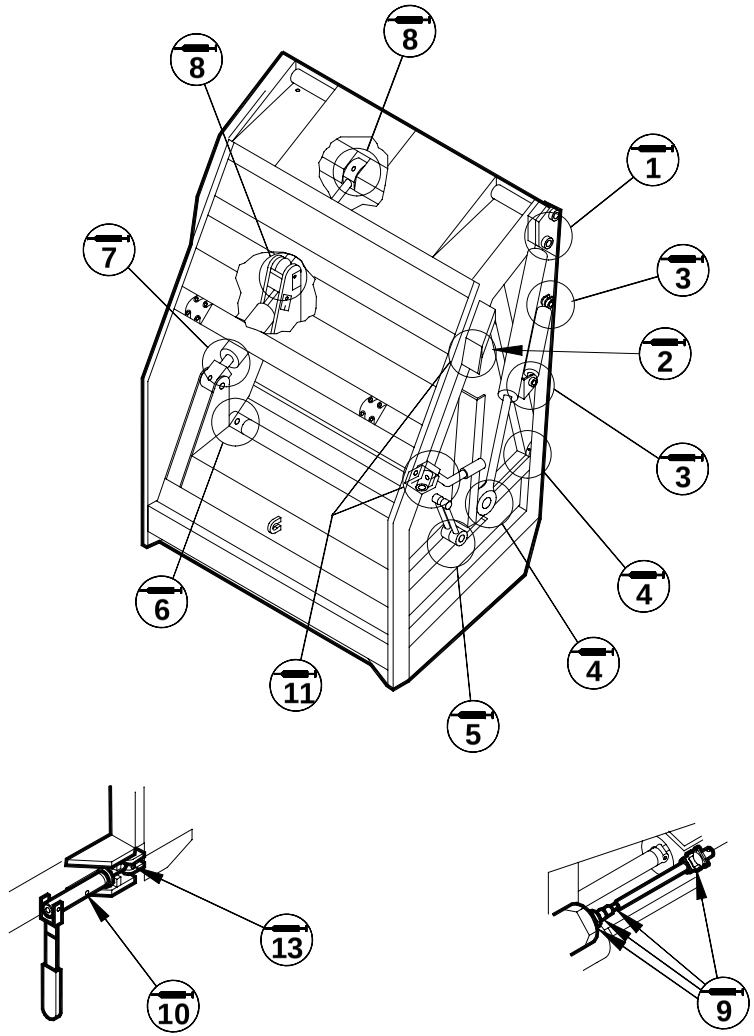


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Formula 5000 Lubrication Guide

Note: Use No. 1 pressure gun grease. Clean fittings before applying grease and always pump enough grease into joint to remove the old grease. Wipe off excess.

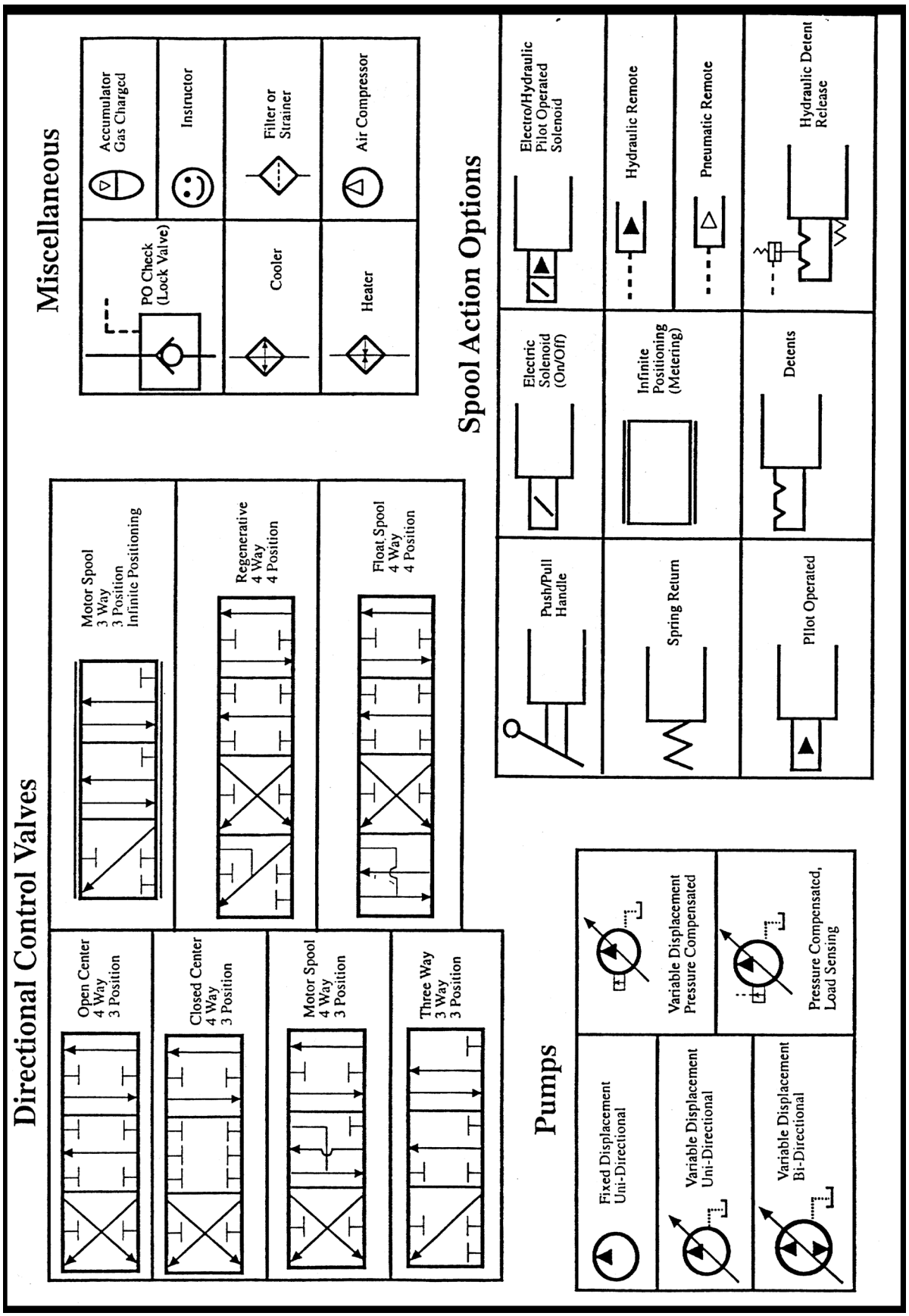
REF. NO.	LOCATION	QTY.	INTERVAL
1	Tailgate Hinge	2	Weekly/40 Hours
2	Outside Packing Cylinder (Both Ends)	4	Weekly/40 Hours
3	Tailgate Raise Cylinder (Both Ends)	4	Weekly/40 Hours
4	Lower Link Pivot (Both Ends)	4	Weekly/40 Hours
5	Control Handles/Linkage:		Weekly/40 Hours
	A. Upper Bellcranks	2	
	B. Kick-Out Lever	1	
	C. Lower Yoke Ass'y	2	
	D. Control Handle Pivots	2	
6	Packer Panel Pivot (Bottle Pin to Upper Panel)	4	Weekly/40 Hours
7	Inside Packing Cylinder (Both Ends)	4	Weekly/40 Hours
8	Upper Link Arms	4	Weekly/40 Hours
9	PTO (Pump) Drive Shaft	4	Weekly/40 Hours
	Front Mount Drive Shaft	3	Weekly/40 Hours
10	Tailgate Turnbuckle Clamps	2	Weekly/40 Hours
11	Container Mech. Control		
	A. Handle	1	Weekly/40 Hours
	B. Upper Pivot	1	Weekly/40 Hours
12	Ejector Cylinder (Not Shown)	1	Weekly/40 Hours
13	Tailgate Eye Bolts		Weekly/40 Hours
14	Access Door Hinges (Not Shown)		Weekly/40 Hours



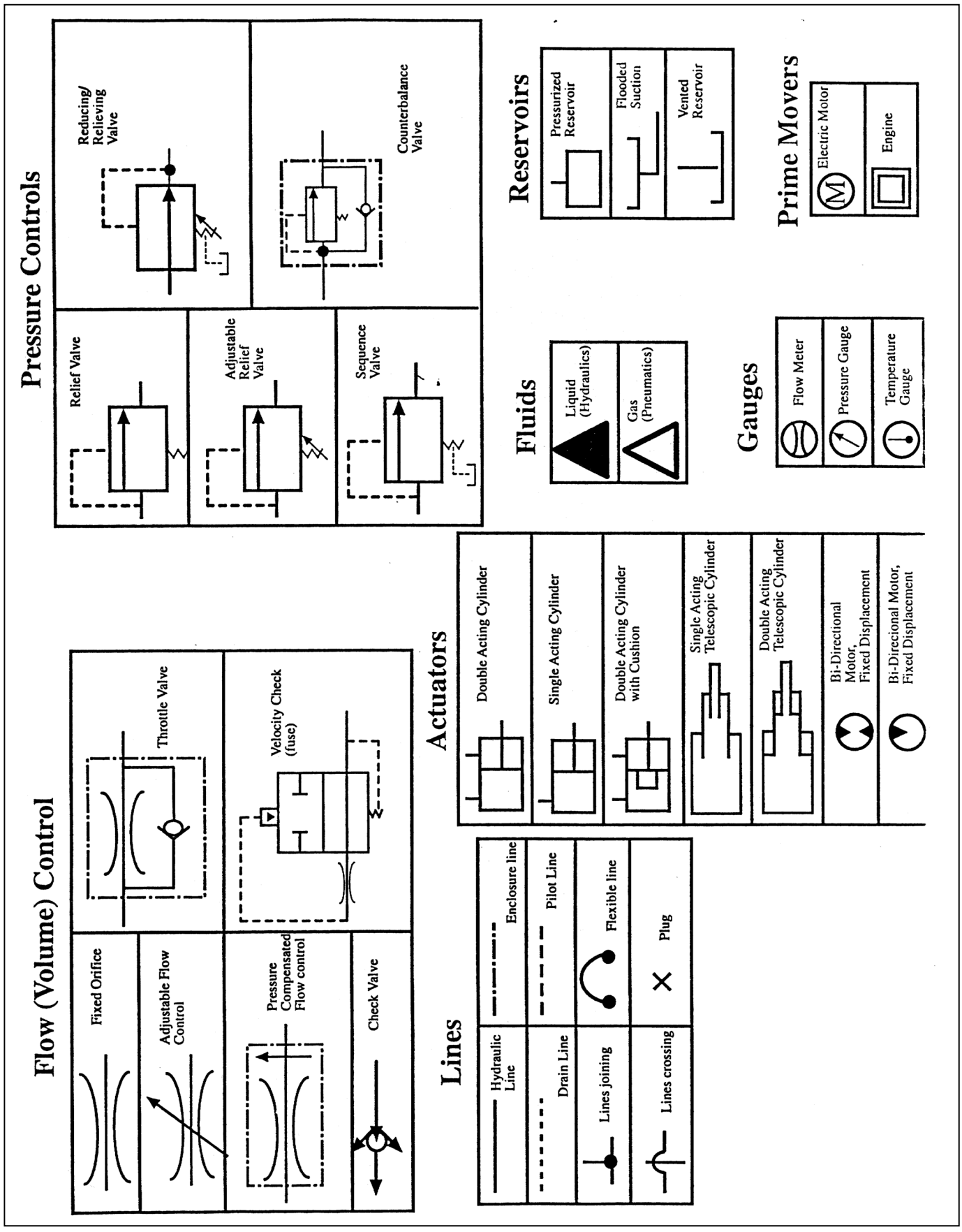
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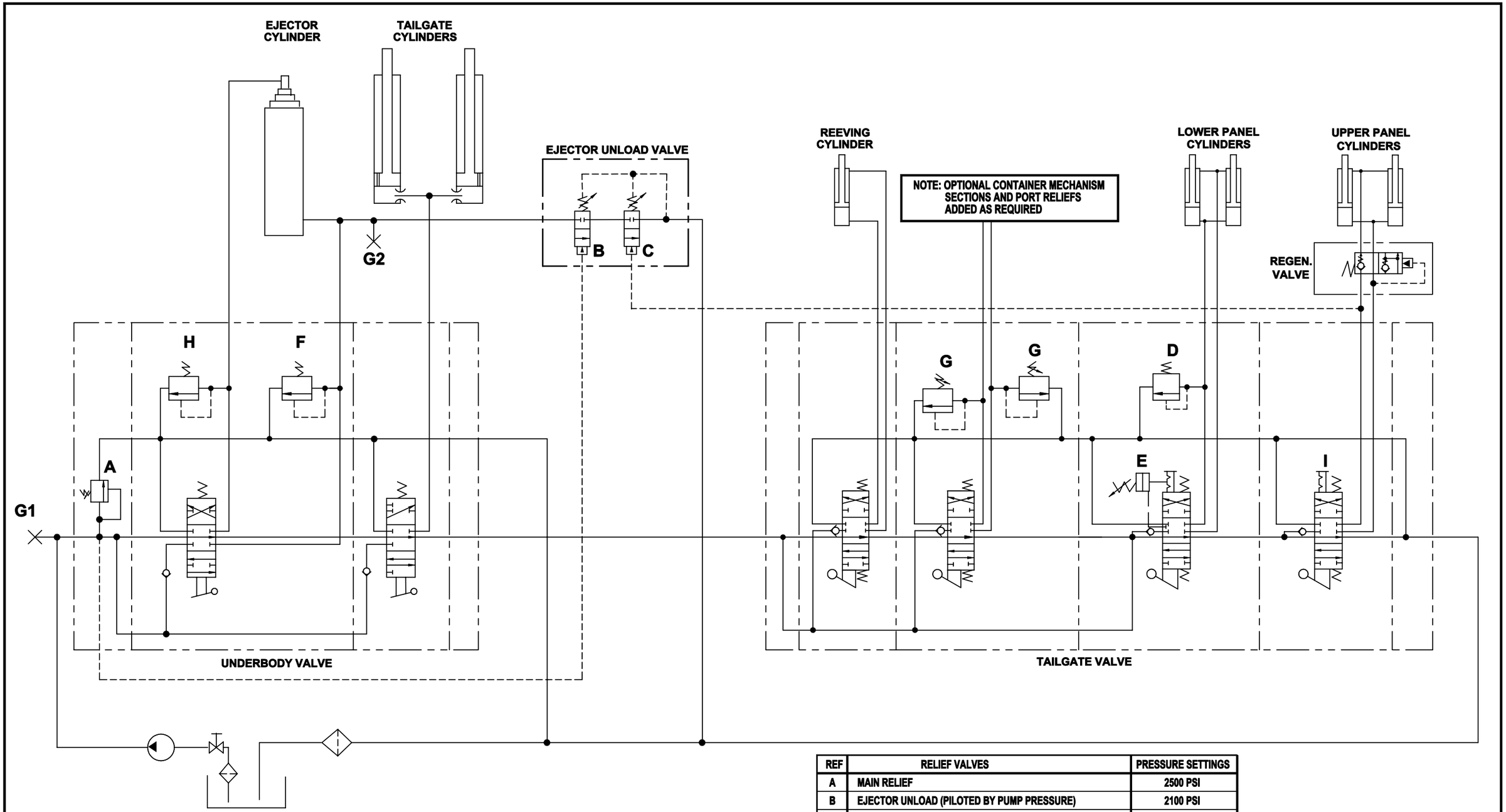
HYDRAULIC SYMBOLS



HYDRAULIC SYMBOLS



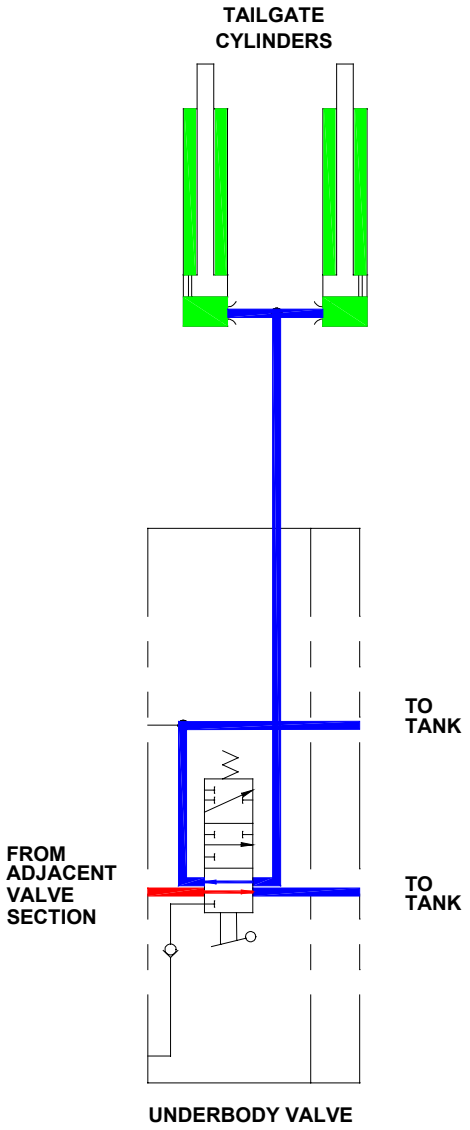
HYDRAULIC SCHEMATIC



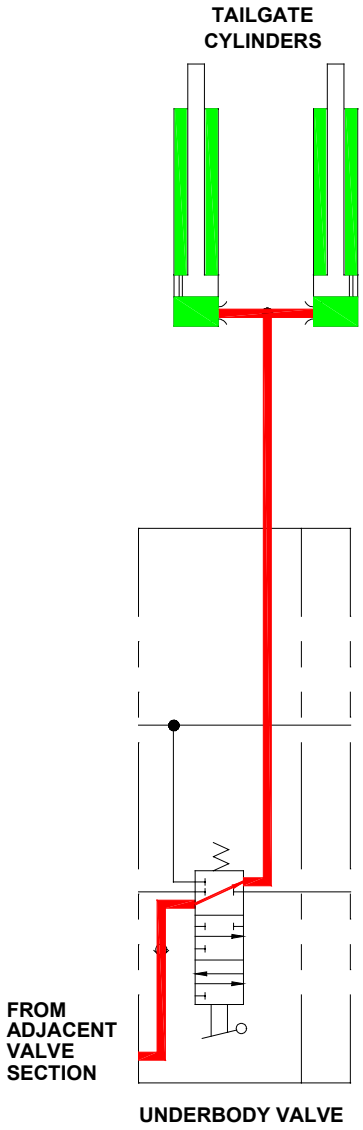
GAUGE POST LOCATIONS	
G1	GAUGE PORT (SYSTEM PRESSURE)
G2	GAUGE PORT (EJECTOR UNLOAD PRESSURE)

REF	RELIEF VALVES	PRESSURE SETTINGS
A	MAIN RELIEF	2500 PSI
B	EJECTOR UNLOAD (PILOTED BY PUMP PRESSURE)	2100 PSI
C	EJECTOR UNLOAD (PILOTED BY UPPER PANEL CYLINDER)	2350 PSI
D	LOWER PANEL BACK OFF	3900 PSI
E	LOWER PANEL (HYDRAULIC DETENT)	2400 PSI
F	EJECTOR BASE RELIEF	2800 PSI
G	OPTIONAL CONTAINER MECHANISM PORT RELIEFS	1400 PSI
H	EJECTOR ROD RELIEF	2800 PSI
I	UPPER PANEL DETENT MECHANICAL BOTH WAYS	----------

TAILGATE LOWER



TAILGATE RAISE



LEGEND

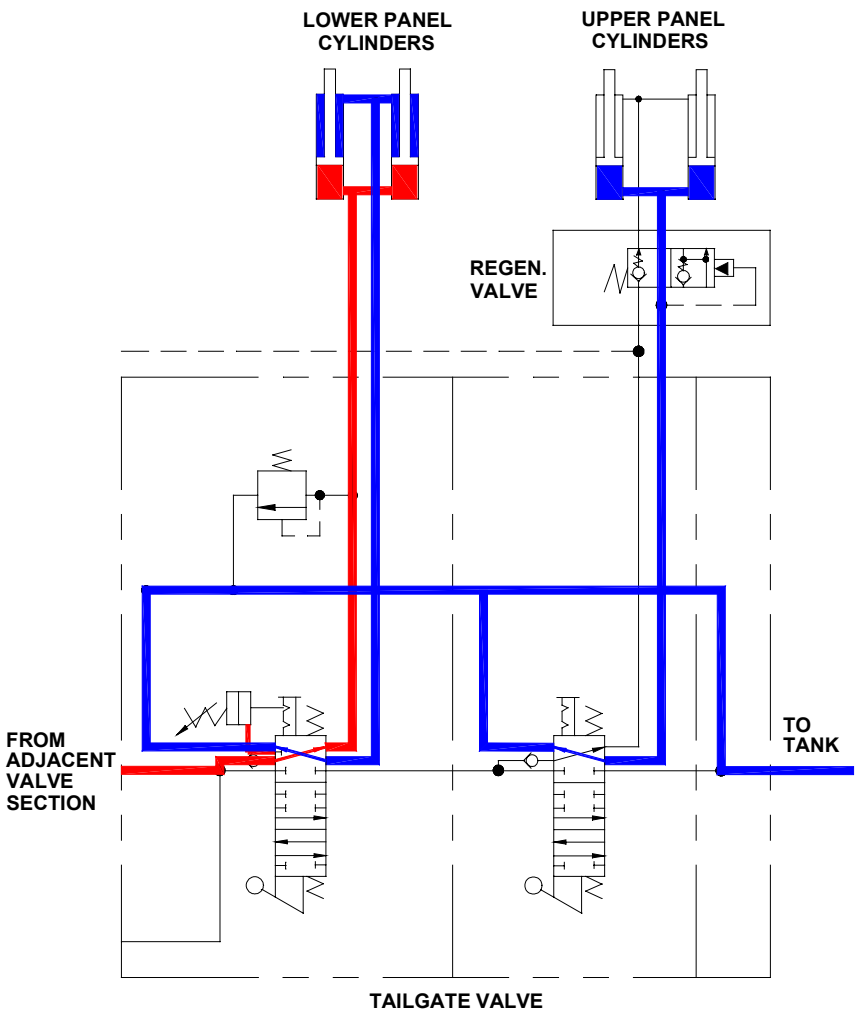
= PUMP PRESSURE

= RETURN PRESSURE

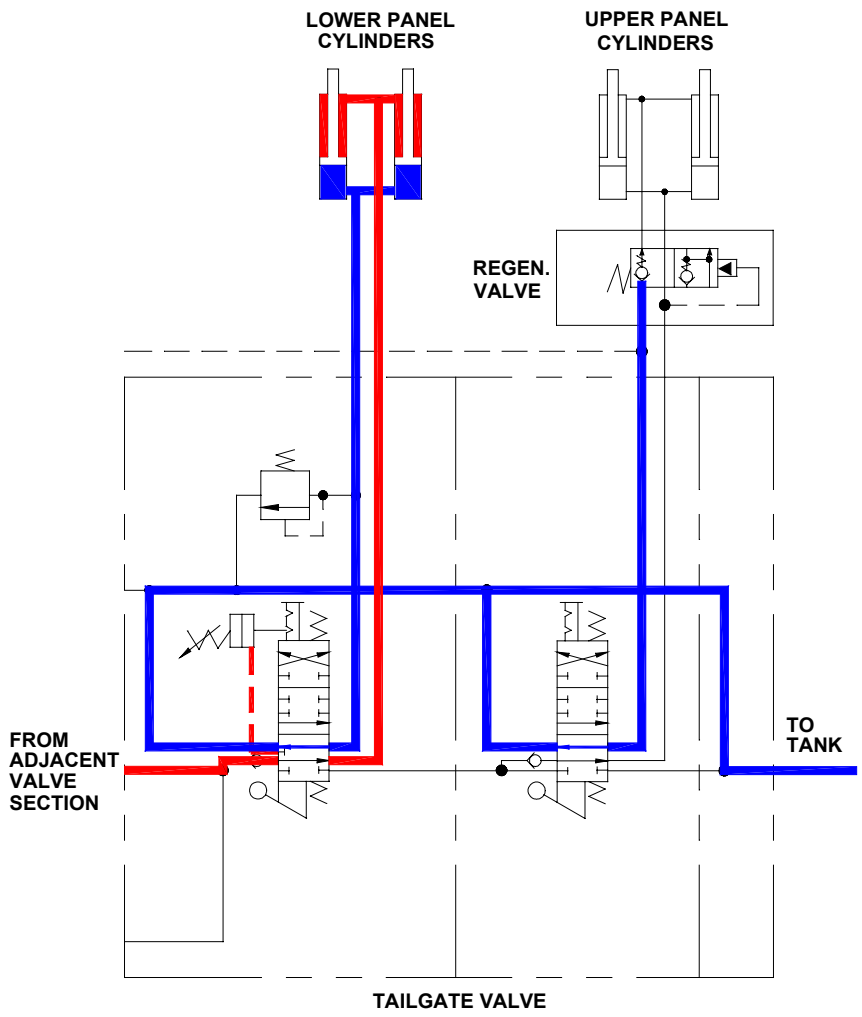
= INTERMEDIATE PRESSURE

701-8426-2

BLADE (LOWER PANEL) DOWN



BLADE (LOWER PANEL) UP



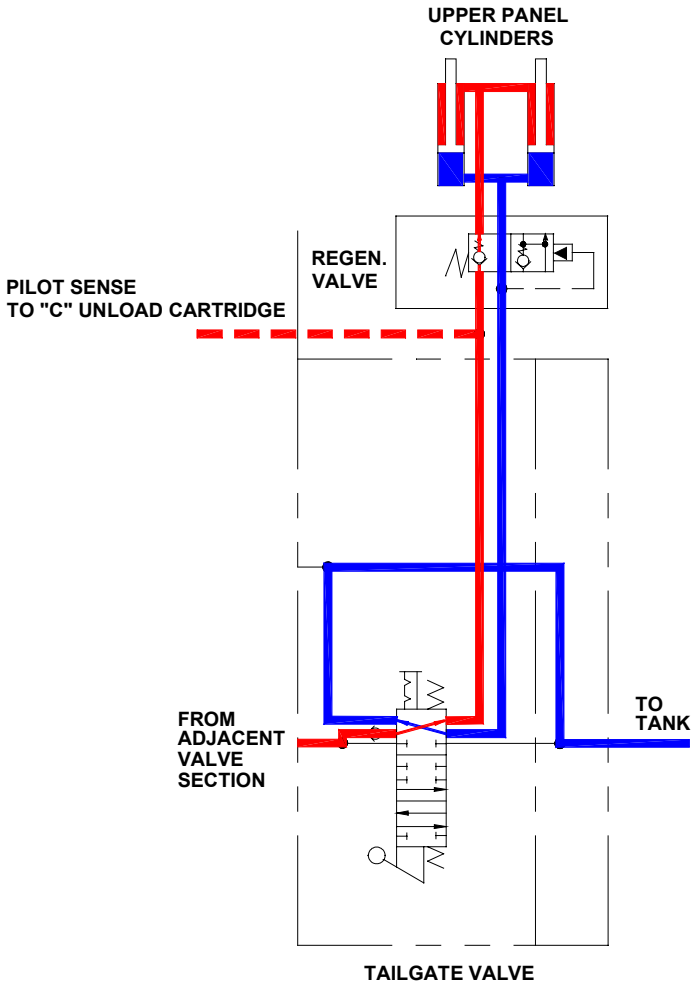
LEGEND

= PUMP PRESSURE

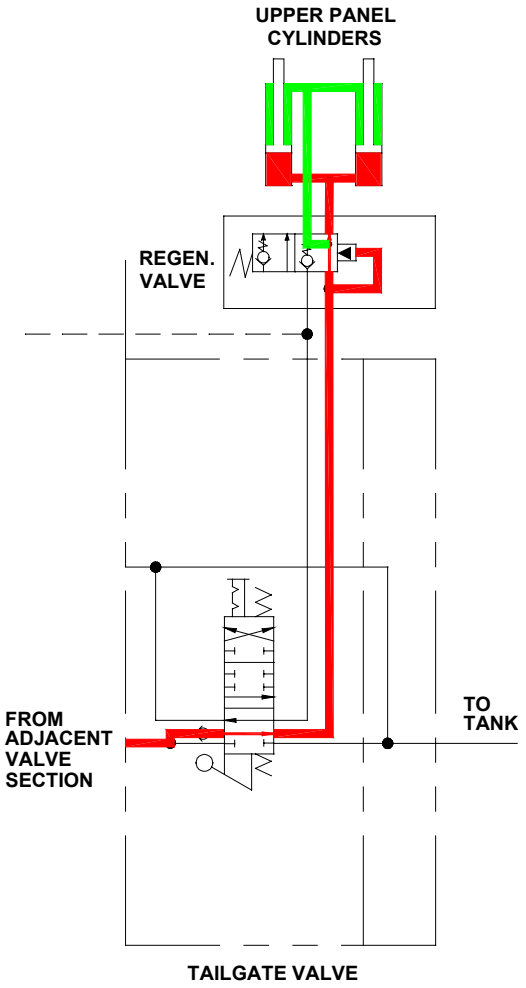
= RETURN PRESSURE

701-8426-3

UPPER PANEL - IN



UPPER PANEL - OUT



LEGEND

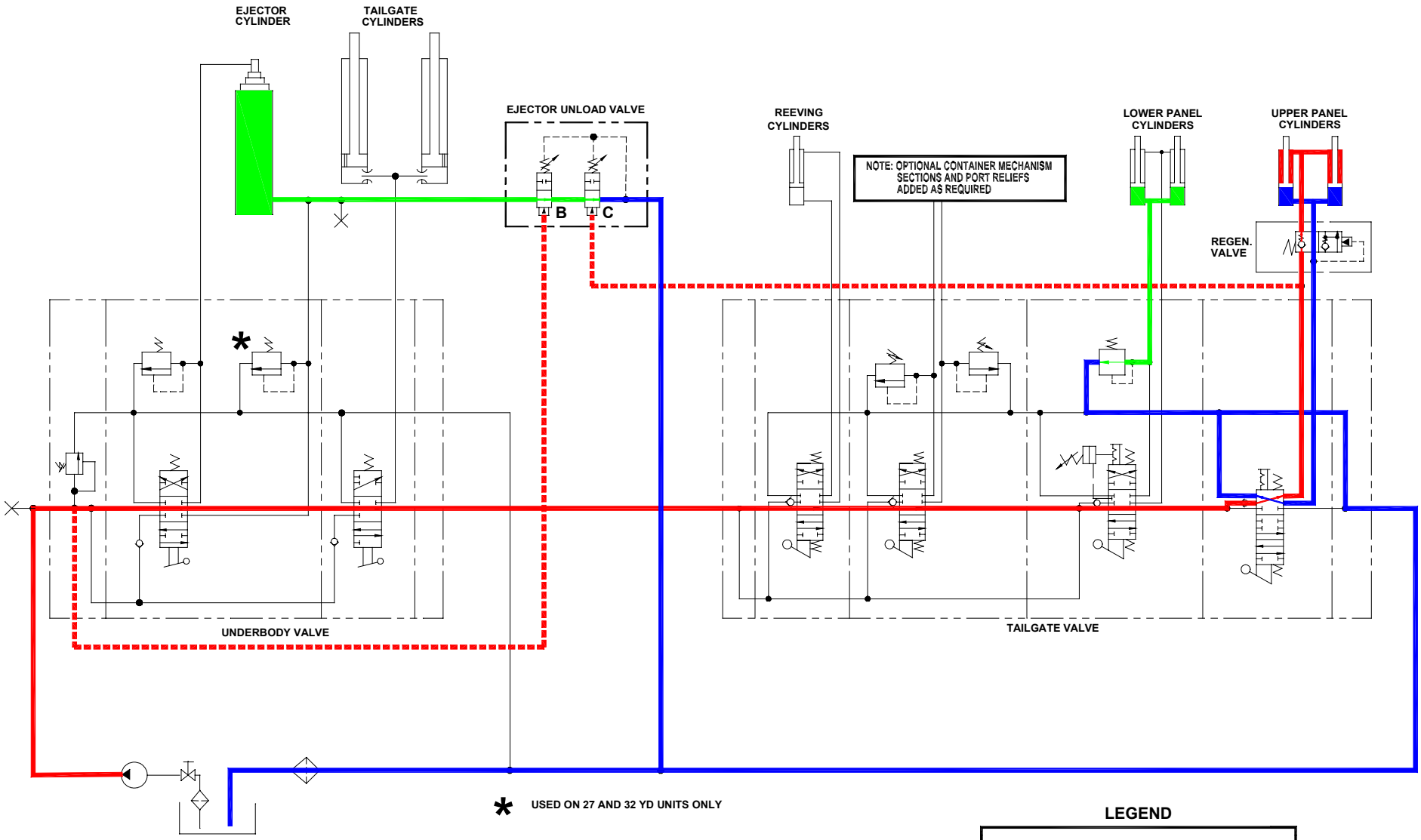
= PUMP PRESSURE

= RETURN PRESSURE

= INTERMEDIATE PRESSURE

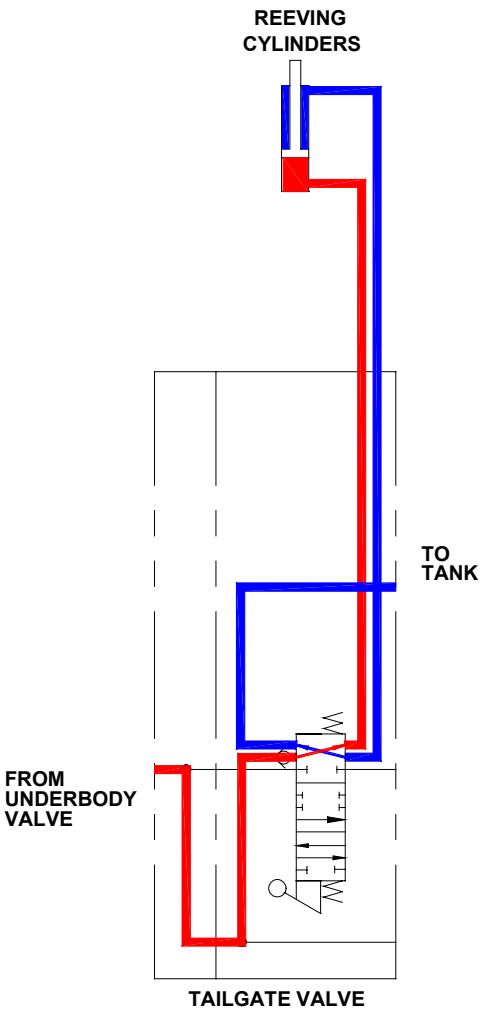
701-8426-4

UPPER PANEL-IN - EJECTOR UNLOADING & BLADE (LOWER PANEL) BACKING OFF

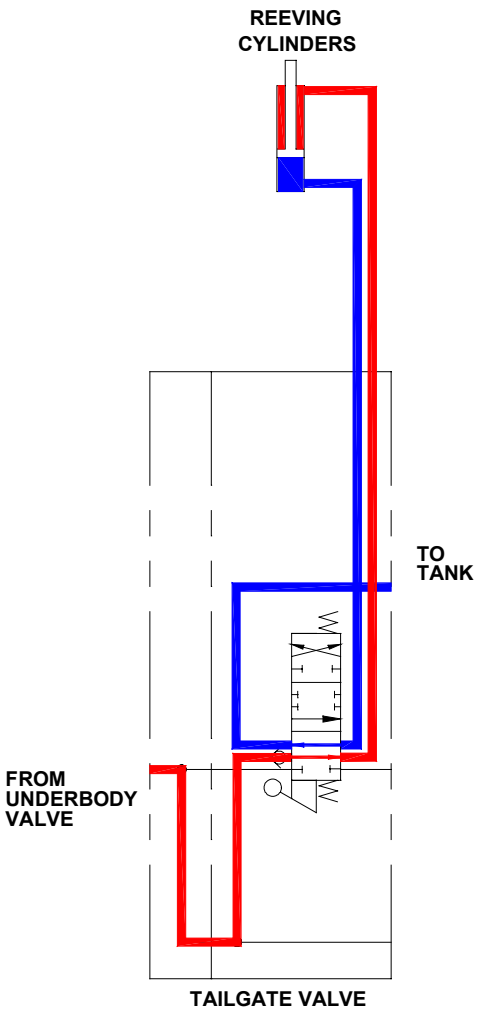


701-8426-5

REEVING CYLINDER RAISING CONTAINER



REEVING CYLINDER LOWERING CONTAINER



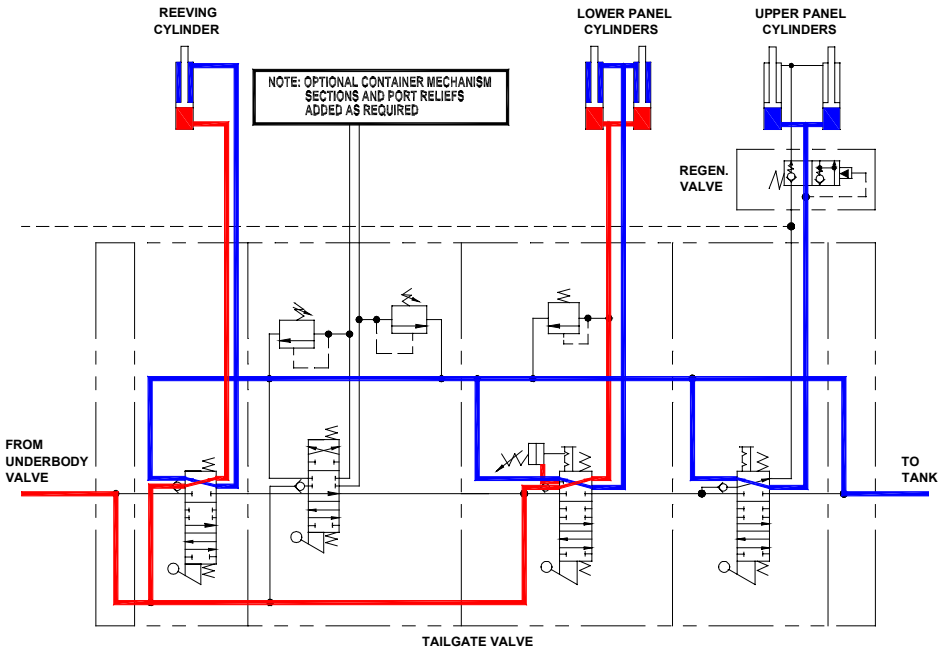
LEGEND

= PUMP PRESSURE

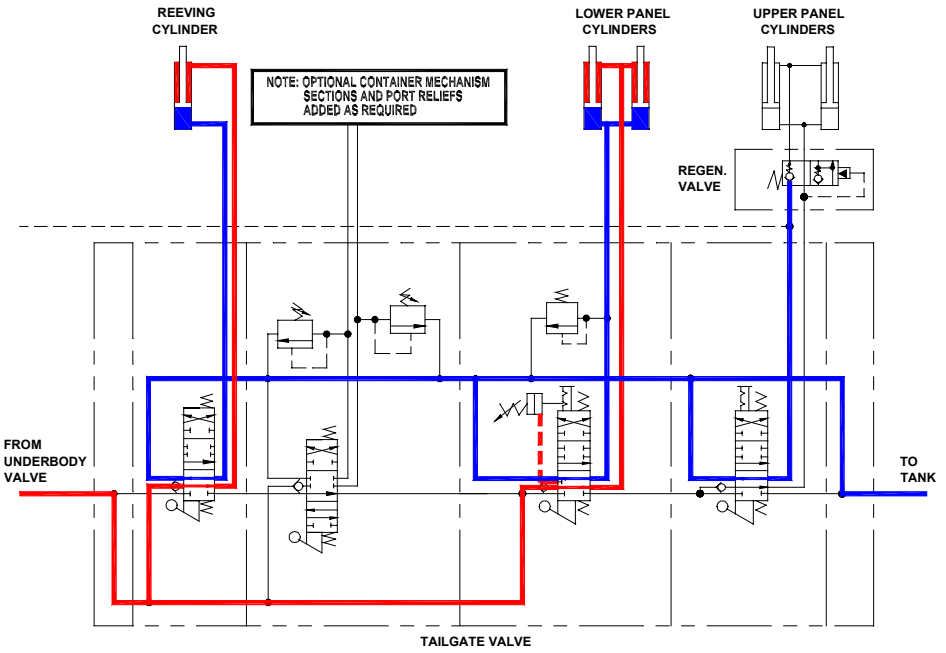
= RETURN PRESSURE

701-8426-6

REEVING CYLINDER RAISING CONTAINER DURING BLADE DOWN



REEVING CYLINDER LOWERING CONTAINER DURING BLADE UP



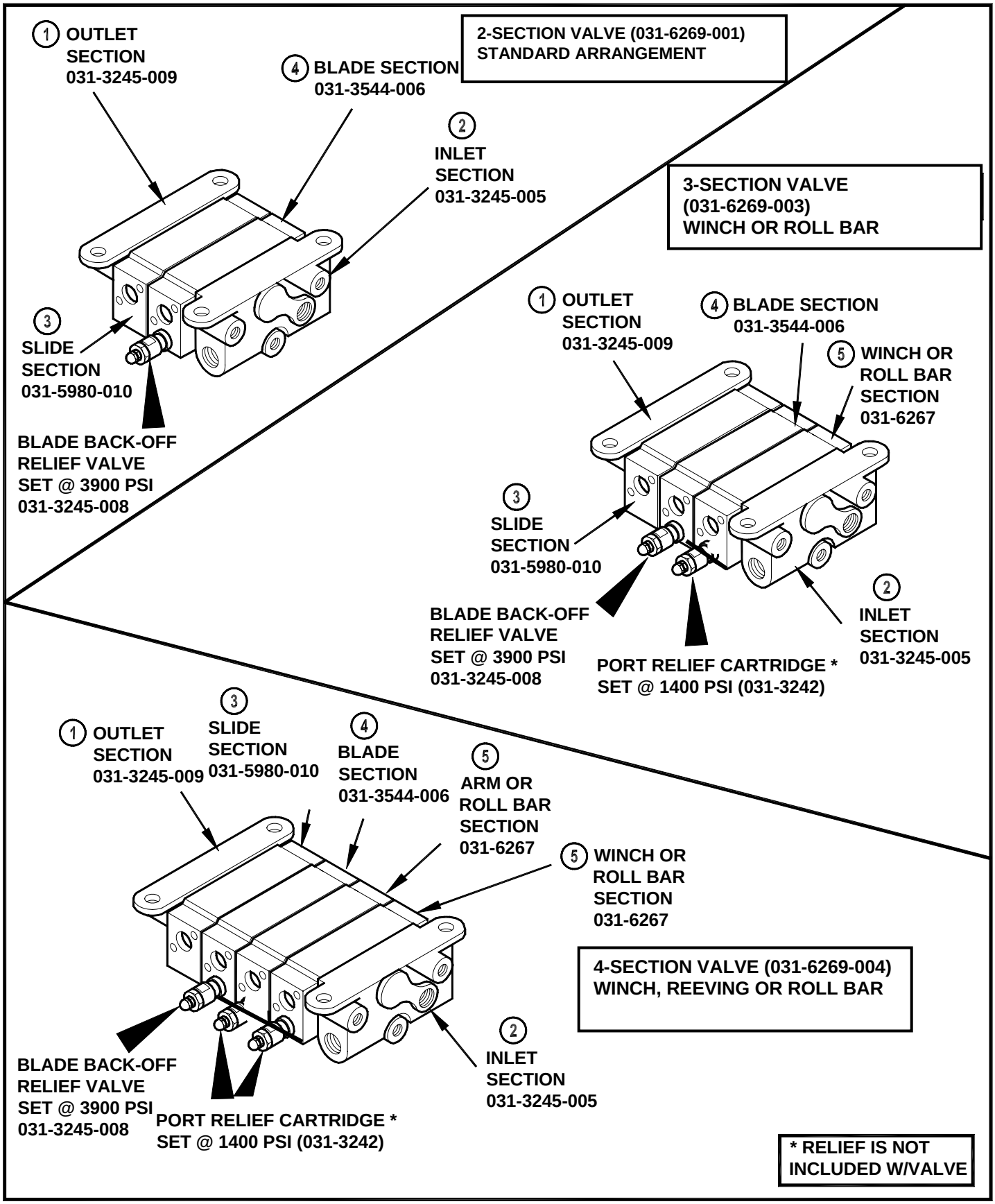
LEGEND

= PUMP PRESSURE

= RETURN PRESSURE

701-8426-7

TAILGATE (SECONDARY) VALVE
031-6269-002, 003, 004



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A. TAILGATE VALVE

The packing mechanism is controlled by two levers at the right rear corner of the tailgate. These levers control the upper panel and the lower panel. Refer to the operator's manual for correct operation of these two levers.
The upper and lower panel functions can be operated independently by engaging one lever at a time.

TAILGATE CONTROL VALVE PRESSURE SETTINGS

The tailgate valve has some pressure settings that are adjustable. All valve pressure adjustments should be made with the engine running at the normal operating speed for the function that is being adjusted. Not all-miniscule steps are listed below only the main action steps are called out to simplify the procedure. Common sense must be used during the minor steps such as shutting off the pump to connect and disconnect a hydraulic pressure gauge, unlocking and locking an adjusting screw with a jam nut, reading the pressure gauge, bottoming out (deadheading) a function, etc. Generally hydraulic pressures are normally increased by turning the pressure adjusting screw clockwise or decreased by turning the pressure adjusting screw counterclockwise. Follow the steps below to adjust the pressures.

NOTE: ALWAYS SET UNIT IN LOCK-OUT/TAG OUT BEFORE STARTING ANY PROCEDURE. SEE FRONT OF SECTION FOR PROCEDURES.

A. Connect an accurate 0-3000 PSI liquid filled pressure gauge to the gauge port quick disconnect fitting used to check the main system pressure.

Adjust the lower panel hydraulic detent

Note: All mechanical linkage must be free of any binding.

1. Lower the main relief pressure by turning the main relief adjusting screw out (counter clockwise) 4 turns.

⚠ DANGER

Stand clear when packing mechanism is in motion.

2. With the engine and pump "on" place the upper panel to the fully out position.

3. Move the lower panel control lever to shift the spool in either direction. The lower panel will travel to the end of the stroke but will not release the dent and shift to the neutral position.

4. Slowly turn the main relief valve adjusting screw in (clockwise) to increase the pressure. Watch the pressure gauge to see what the pressure is when the spool kicks out of dent and returns to the neutral position. The correct kick-out pressure for the lower panel is 2350 +/-50 PSI.

⚠CAUTION

Do not stand in the hopper or on the hopper sill while adjustments are being made on the packing mechanism with the machine running.

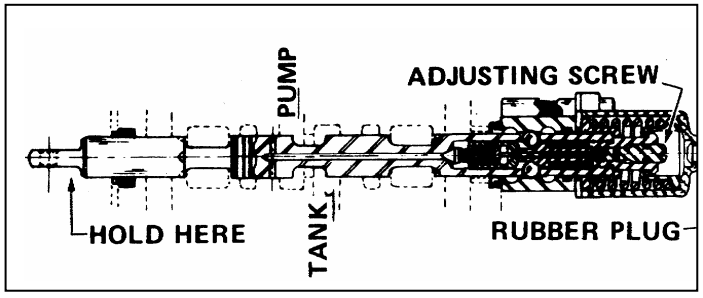
5. If the setting is incorrect, place the unit in the lockout position and remove the rubber plug from the end of the upper panel spool to expose the dent release adjusting screw.

6. Insert a screwdriver and turn the dent adjusting screw in (clockwise) to increase the kick-out pressure or out (counterclockwise) to decrease the pressure.

NOTE: Be careful not to force the adjusting screw or it may deform the internal adjusting rod and make the valve inoperative.

7. Repeat steps 1 through 4 to check the results.

Note: The upper panel has a hydraulic detent for extend set @ 2400 PSI and mechanical detent for retract function. and is adjusted mechanically. (see Upper Panel Kick-out Adjustment Procedures).



HYDRAULIC DETENT

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Adjust the upper panel hydraulic detent

Note: The upper panel has a hydraulic detent for down set @ 2400 PSI and mechanical detent for the up function. and is adjusted mechanically. (see Upper Panel Kick-out Adjustment Procedures).

Note: All mechanical linkage must be free of any binding.

1. Lower the main relief pressure by turning the main relief adjusting screw out (counter clockwise) 4 turns.

⚠ DANGER

Stand clear when packing mechanism is in motion.

2. With the engine and pump "on" move the upper panel control lever to shift the spool in the down direction. The upper panel will travel to the end of the down stroke but will not release the dent and shift to the neutral position.

3. Slowly turn the main relief valve adjusting screw in (clockwise) to increase the pressure. Watch the pressure gauge to see what the pressure is when the spool kicks out of detent and returns to the neutral position. The correct kick-out pressure for the lower panel is 2350 +/-50 PSI.

⚠ CAUTION

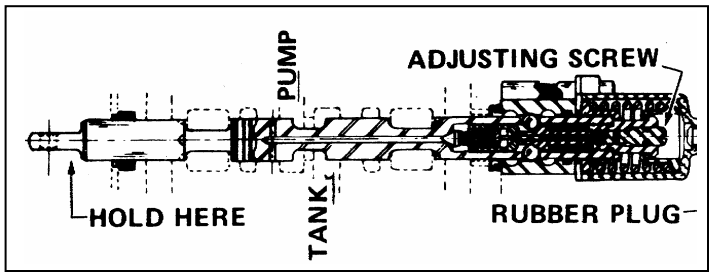
Do not stand in the hopper or on the hopper sill while adjustments are being made on the packing mechanism with the machine running.

5. If the setting is incorrect, place the unit in the lockout position and remove the rubber plug from the end of the upper panel spool to expose the detent release adjusting screw.

6. Insert a screwdriver and turn the detent adjusting screw in (clockwise) to increase the kick-out pressure or out (counterclockwise) to decrease the pressure.

NOTE: Be careful not to force the adjusting screw or it may deform the internal adjusting rod and make the valve inoperative.

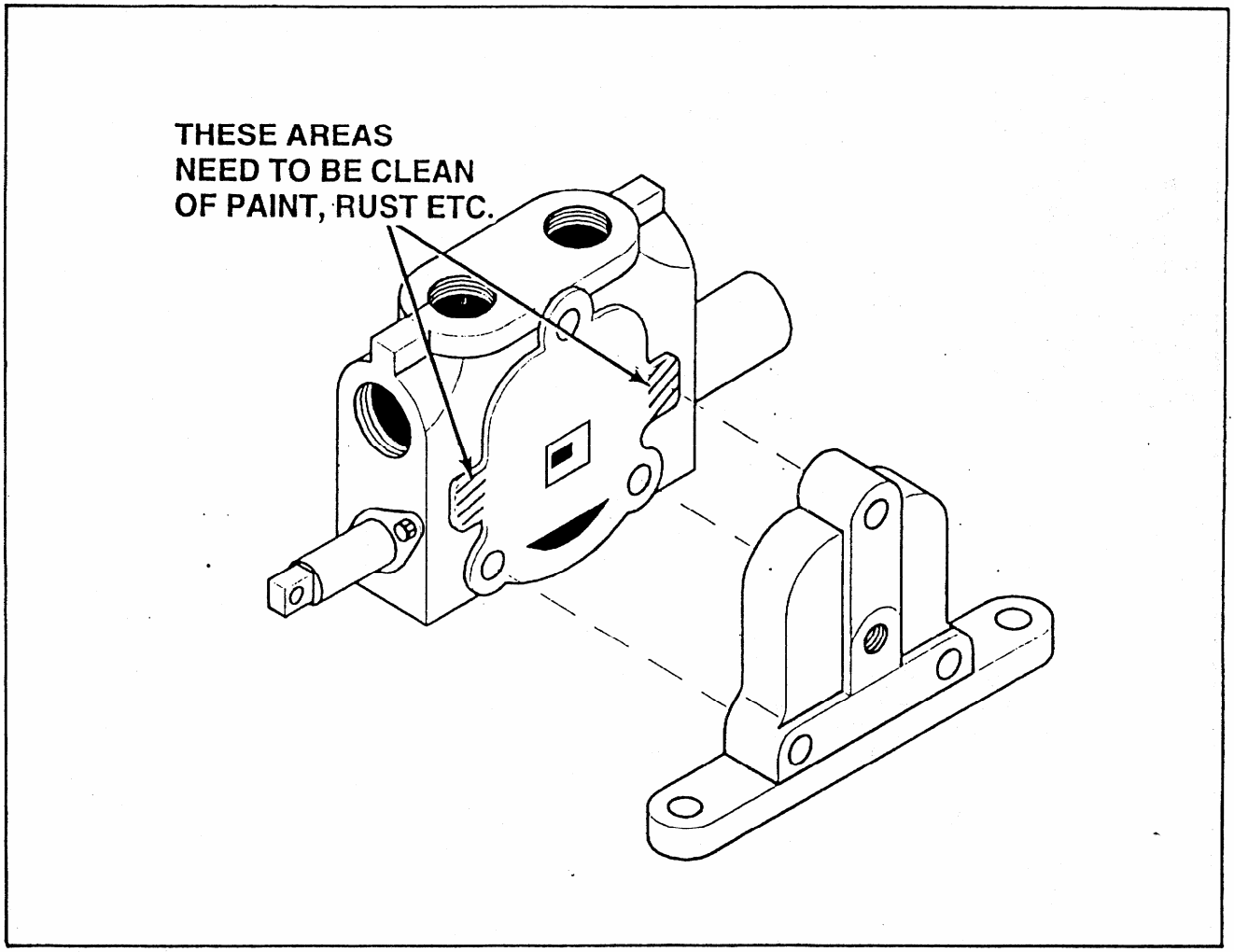
Repeat steps 1 through 4 to check the results



HYDRAULIC DETENT

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When adding auxiliary valve sections to the tailgate valve, make sure that the section is free of all paint, rust, etc.,

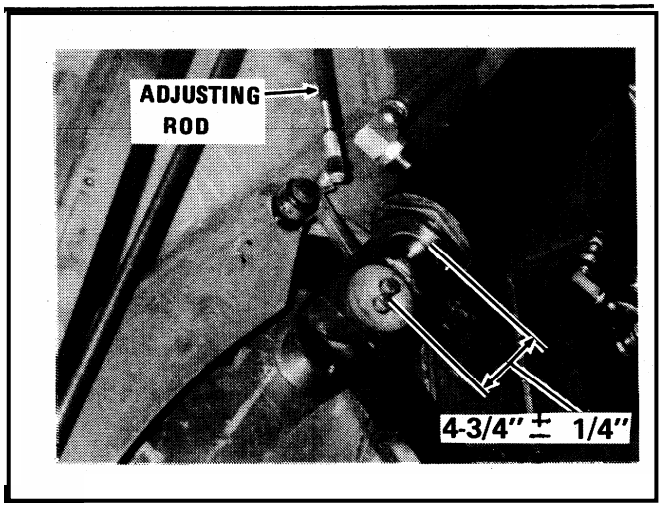


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UPPER KICK-OUT ADJUSTMENT
Tailgate Controls

A. Retract the outside cylinders to full up position.

B. Check distance from cylinder packing nut to center of cylinder mounting pin. This distance should be 4-3/4" +/- 1/4".



UPPER KICK-OUT ADJUSTMENT

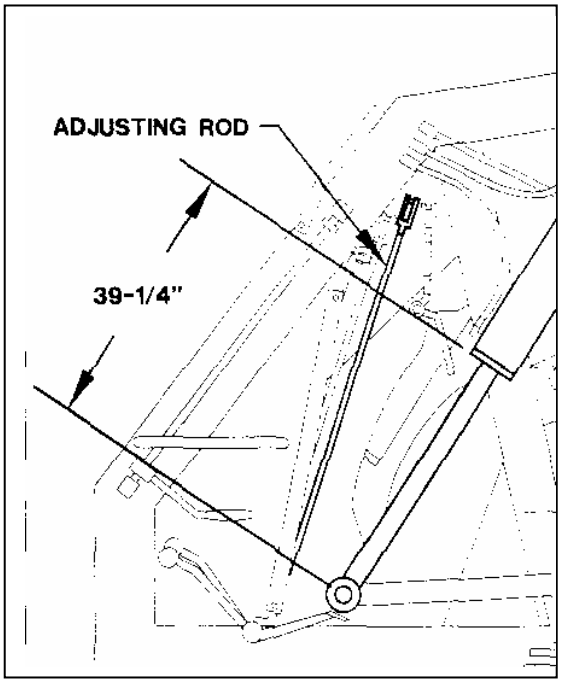
C. If incorrect, loosen jam nuts and turn adjusting rod clockwise to lengthen or counterclockwise to shorten rod, see figure above.

LOWER KICK-OUT ADJUSTMENT
(Tailgate Controls)

1. Extend the outside cylinder to full out position.

2. Check the distance from cylinder packing nut to center of cylinder mounting pin. This distance should be 39-1/4".

3. If incorrect, loosen jam nuts and turn adjusting rod clockwise to shorten or counterclockwise to lengthen the rod.



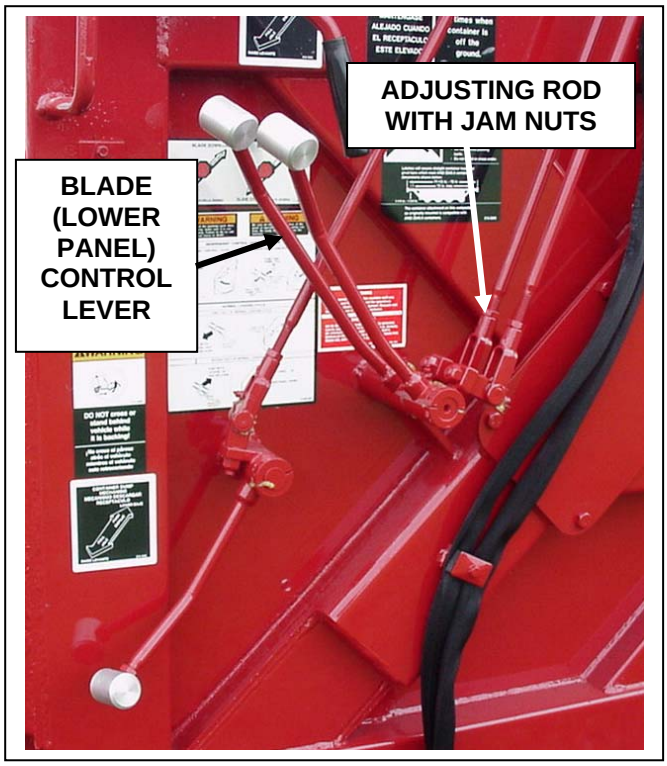
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6. TAILGATE CONTROL LEVER ALIGNMENT

A. The handles should be in line when in the neutral position and the outside cylinder in mid-stroke.

B. If out of alignment, loosen jam nuts on blade control adjusting rod. Turn rod clockwise to shorten or counterclockwise to lengthen.

NOTE: Adjustment can be made by turning blade control lever only.



BLADE BACK-OFF RELIEF ADJUSTMENT

A relief is provided in the tailgate valve to allow the lower panel to back off slightly, (2 to 5 inches of cylinder stroke), during the final stages of packing the load.

If the cylinders back-off excessively (5 to 7 inches of cylinder stroke), the back-off relief needs to be adjusted or replaced.

For proper relief adjustment, contact HEIL product support for further instructions.

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OPTIONAL CONTAINER MECHANISM ADJUSTMENT PROCEDURE

Install an accurate 3000 PSI gauge in the gauge port in section of the body and tailgate valve tapped for a 1/4" NPT gauge connection. MAKE SURE GAUGE HAS BEEN CHECKED FOR ACCURACY.

A. Winch

5. Disengage the front mount pump or PTO.

6. Remove the hoses or tubes and fittings connecting the valve to the winch at the tailgate valve ports.

7. Install o-ring plugs (3/4" – 16) in two of the tailgate valve ports.

8. Engage the front mount pump or PTO.

9. Depress throttle advance and move the winch control lever in both directions.

10. The pressure should read 1400 PSI +/- 100 PSI for a 12,000 lb winch.

11. If pressure is incorrect, make the necessary adjustment by the following procedure;

 g. Remove the cover nut which will expose the adjustment screw on the tailgate valve winch section.
 h. Pull spool out to adjust the relief on detent cap end.
 i. Push spool in to adjust the relief on spool yoke end
 j. Loosen lock nut.
 k. Turn adjusting screw clockwise (in) to increase the pressure or counterclockwise (out) to decrease the pressure.
 l. After proper pressure is attained, tighten the lock nut and re-install cover nut.

12. Reconnect fittings, hoses or tubes if applicable.

A. Arm Mechanism or Roll Bar- without winch – Single Mechanism.

1. Disengage the front mount pump or PTO.

2. Depress throttle advance and engage mechanism control lever until cylinders bottom out in extended position.

3. The pressure should read 1400 PSI +/- 100 PSI with cylinders extended.

4. If pressure is incorrect, make the necessary adjustment by the following procedure;

 a. Remove the cover nut which will expose the adjustment screw on the tailgate valve arm mechanism or roll bar section.
 b. Pull spool out to adjust the relief on detent cap end.
 c. Push spool in to adjust the relief on spool yoke end
 d. Loosen lock nut.
 e. Turn adjusting screw clockwise (in) to increase the pressure or counterclockwise (out) to decrease the pressure.
 f. After proper pressure is attained, tighten the lock nut and re-install cover nut.

.

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TAILGATE PROP OPERATION

IMPORTANT: TAILGATE MUST BE FREE OF REFUSE AND ALL PERSONS CLEAR OF TAILGATE BEFORE PERFORMING THE FOLLOWING STEPS.

⚠CAUTION

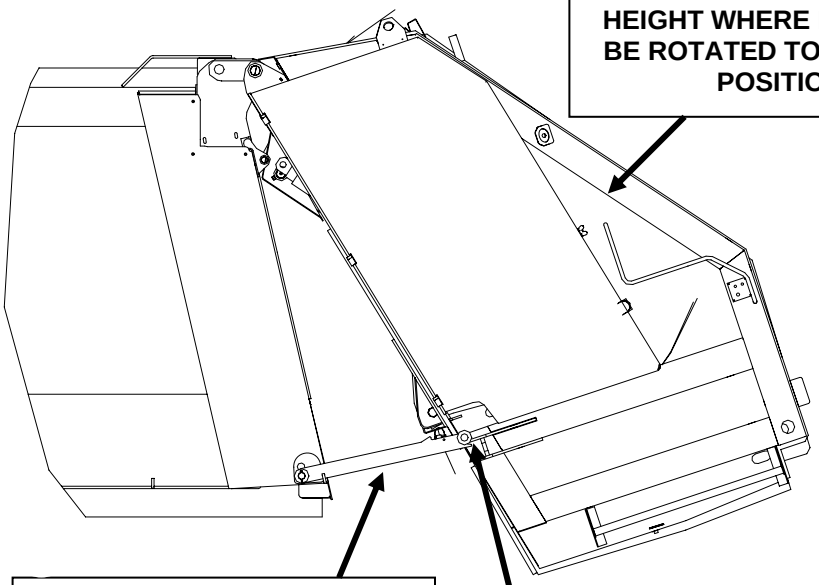
TWO PROPS ARE INSTALLED ON THE UNIT. BOTH MUST BE USED!

TO USE PROPS

1. **Set unit on level surface and apply parking brake.**
2. **Loosen turnbuckle clamps. (Units with automatic tailgate locks do not use these clamps).**
3. **Remove pins holding prop in stored bracket.**
4. **Raise tailgate to height where props can be rotated to support position.**
5. **Rotate props.**
6. **Lower tailgate until props mate with tailgate stop.**
7. **Turn engine off and remove ignition key.**

TO STORE PROPS

1. **Raise tailgate slightly and rotate prop to stored position and install pin.**
2. **Lower tailgate completely and tighten turnbuckle clamps.**



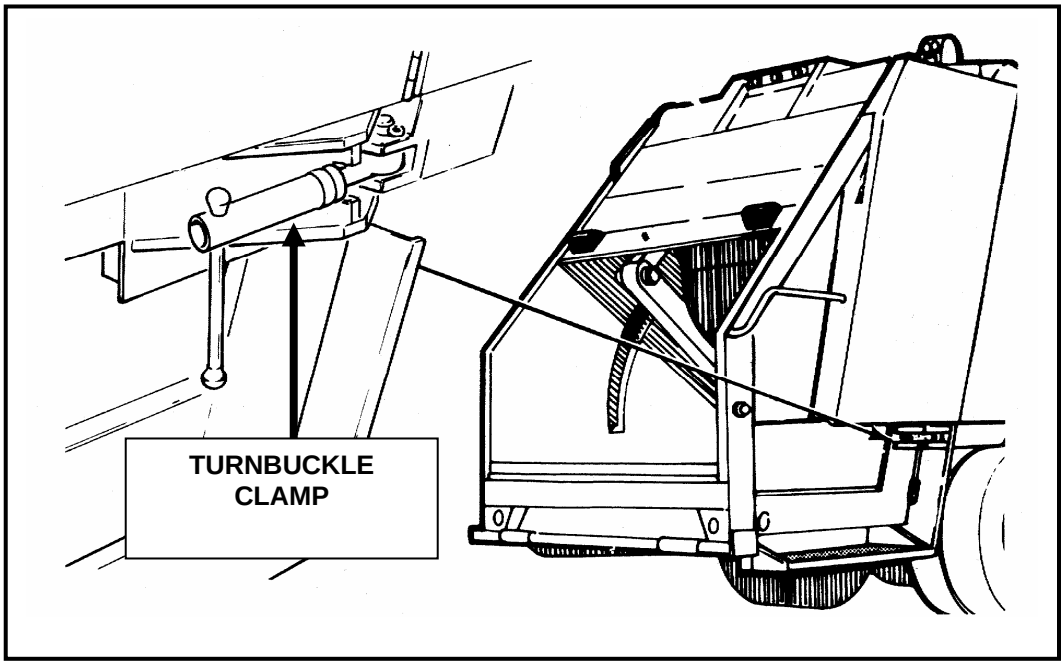
212-2791

TAILGATE TURNBUCKLE CLAMPS

Turnbuckle clamps re located on both sides of the unit and are used to keep the tailgate locked to the body.

These clamps should never be opened (unscrewed) unless servicing the unit or emptying the body.

They need to be unscrewed before the tailgate is raised.

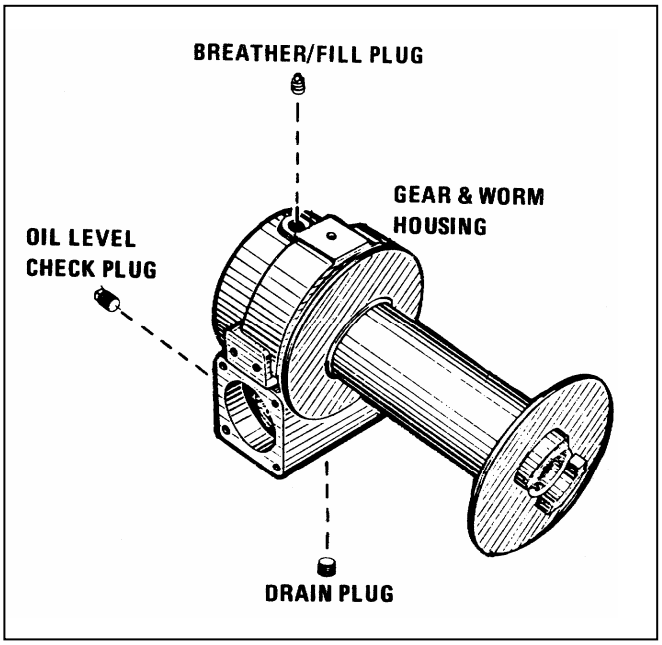


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OPTIONAL WINCH OIL LEVEL CHECK PROCEDURE

Check winch oil level every 2 months or 400 hours, whichever comes first.

If low on oil, add AGMA Grade 7EP (140 wt.) gear oil. Example brand name is Texaco Meropa 460. Be sure lubricant added is functional equivalent of brand name. For more service information, see winch manual provided with the unit.



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All Units



SERVICE MANUAL

SECTION 7
LIGHTS AND LAMPS

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SMS7-SWS-706213-0909

Customer Support
Heil Environmental ▪ 4301 Gault Ave. North . Fort Payne, AL 35967-9984 · 866.275.4345

All Units

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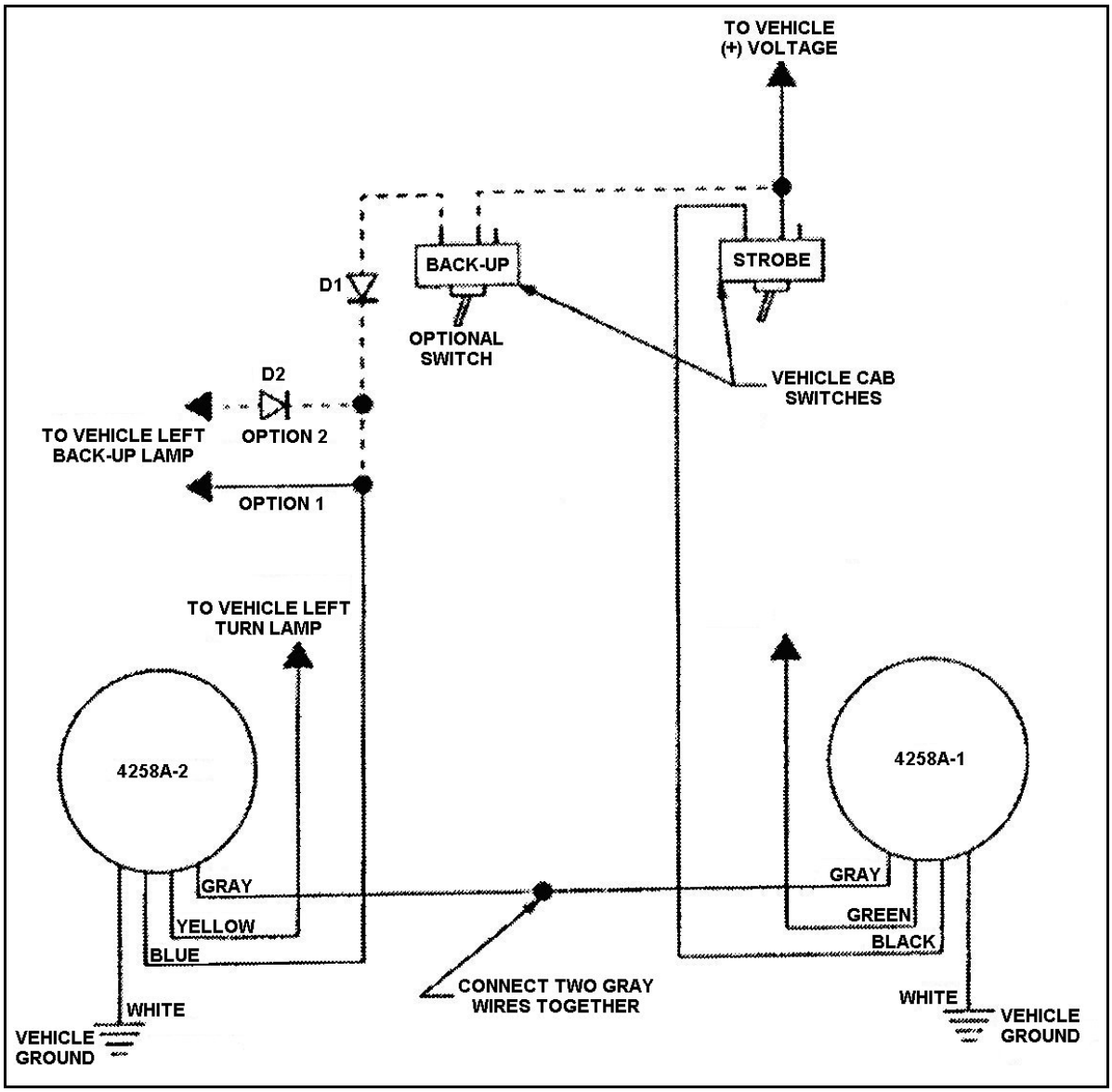
Smart Lamp Light Systems 702
Lights 704

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SMART LAMP LIGHT SYSTEMS

Heil uses two different lighting systems. Both systems use LED lights that function as strobe lights and turn signals. The strobe function is manually activated with a switch in the cab or configured to strobe automatically when the vehicle is shifted into reverse. Activating a turn signal automatically overrides the strobe function so that the strobe light functions as a turn signal.

The two-light system contains one master light and one slave light. Both lights have a different part number and cannot be replaced or mixed with a different brand light. Some vehicles use two of the two-light systems combined for a total of four rear lights. When used in this combination, there four strobe lights but only two lights are synchronized.

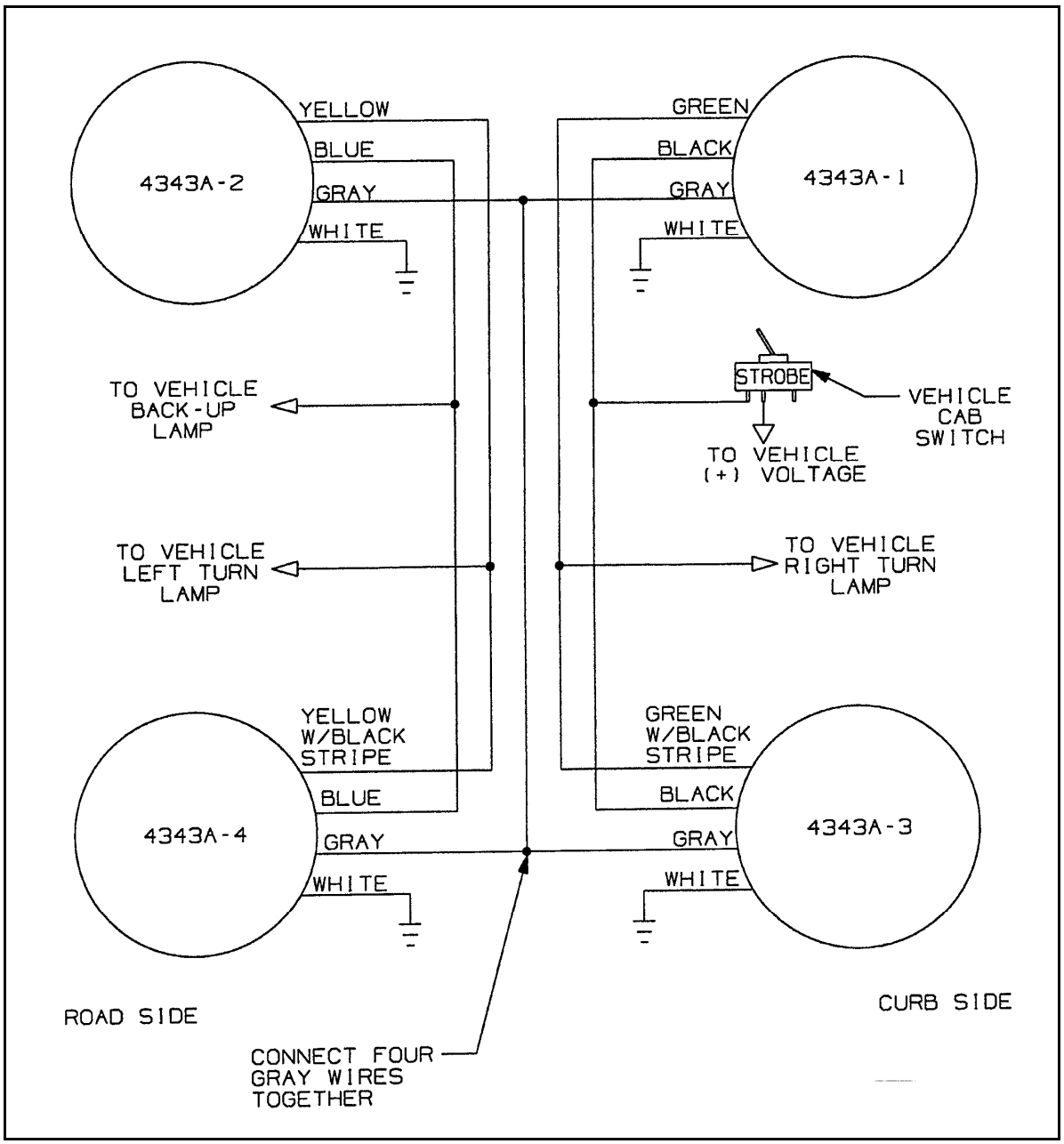


TWO-LIGHT SYSTEM

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All Units

The four-light system contains one master light and three slave lights. Each light has a different part number and cannot be replaced by another brand or mixed with a different brand light. This system provides for a total of four strobe lights that are synchronized to strobe in the same sequence.



FOUR-LIGHT SYSTEM

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All Units

LIGHTS

PART NO.	DESCRIPTION	REQ'D
115-0608	LIGHT, license plate (no breakdown)	REF
115-0742	LIGHT, stop, turn/tail (red) 4.00"	REF
115-0742-001	LIGHT	1
115-0742-002	GROMMET	1
115-0742-003	PIGTAIL	1
115-0743	LIGHT, back-up (clear) 4.00"	REF
115-0743-001	LIGHT	1
115-0743-002	GROMMET	1
115-0743-003	PIGTAIL	1
115-0760	LIGHT, clearance, (red) 2-1/2"	REF
115-0760-001	LIGHT	1
115-0760-002	GROMMET	1
115-0760-003	PIGTAIL	1
115-0761	LIGHT, clearance (amber)	REF
115-0761-001	LIGHT	1
115-0760-002	GROMMET	1
115-0760-003	PIGTAIL	1
115-0782	LIGHT, mid-turn (amber)	REF
115-0782-001	LIGHT	1
115-0782-002	GROMMET	1
115-0869-002	PIGTAIL	1
115-0869	LIGHT, stop (red) oval	REF
115-0869-001	LIGHT	1
115-1180	LIGHT, LED strobe	REF
115-1180-001	LAMP	1
115-1179-002	PLUG	1
115-0869-003	GROMMET	1
115-1224	LAMP, trapezoidal w/conn	REF
115-0918	LIGHT, trapezoidal beam	1
108-6461-012	DEUTSCH DT, 2 pin receptacle	1
108-7336-002	LOOM, 3/8" dia., unsplit	1'
115-1226	LIGHT, flood	REF
115-1225	LIGHT, work	1
108-6461-012	DEUTSCH DT, 2 pin receptacle	1
108-7336-002	LOOM, 3/8" dia., unsplit	1'
115-1230	LIGHT, LED clearance	REF
115-1045-001	LIGHT, LED clearance, red 2-1/2"	1
115-0720-002	GROMMET, mounting	1
115-1231	LIGHT, LED clearance	REF
115-1046-001	LIGHT, LED amber, 2-1/2"	1
115-0760-002	GROMMET, mounting	1

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All Units

PART NO.	DESCRIPTION	REQ'D
115-1232	LIGHT, strobe with brush guard	REF
115-1232-001	LIGHT, strobe	1
115-1232-002	GUARD, brush, strobe light	1
115-1246	LIGHT, LED	REF
115-1246-001	LIGHT, LED stop, turn, tail, red 4"	1
115-1246-002	GROMMET, 4" round	1
115-1247	LIGHT, LED flasher	REF
115-1247-001	LIGHT, LED, flasher, amber 4"	1
115-1246-002	GROMMET, 4" round	1
115-1248	LIGHT, LED	REF
115-1248-001	LIGHT, LED, S/T/T, 6" red oval	1
115-1248-002	GROMMET, 6" oval	1
115-1249	LIGHT, LED	REF
115-1249-001	LIGHT, LED, turn, 6" amber oval	1
115-1248-002	GROMMET, 6" oval	1
115-1269-001	LIGHT, LED, (amber) smart lamp, RH	REF
115-1269-RGT	LIGHT, LED, 4" amber smart lamp, right turn	1
115-0742-002	GROMMET, mount	1
115-1269-002	LIGHT, LED, (amber) smart lamp, LH	REF
115-1269-LFT	LIGHT, LED, 4" amber smart lamp, left turn	1
115-0742-002	GROMMET, mount	1
115-1271	LIGHT, LED, license plate	REF
115-1271-001	LAMP, LED license	1
115-1271-002	BRACKET, LED license plate light	1
115-1360	LIGHT, LED, stop, turn/tail (red), 4.00"	REF
115-0742-002	GROMMET, mount	1
115-1360-001	LIGHT, LEG, stop, turn, tail, red, 4"	1
115-1361	LIGHT, LED, back-up (clear) 4.00"	REF
115-0742-002	GROMMET, mount	1
115-1361-001	LIGHT, LED reverse	1
115-1362	LIGHT, LED, clearance, (red) 2-1/2"	REF
115-0760-002	GROMMET, mount	1
115-1362-001	LIGHT, LED, clearance, red 2-1/2"	1
115-1363	LIGHT, LED, mid-turn (amber)	REF
115-0869-002	GROMMET, oval	1
115-1363-001	LIGHT, LED, mid-turn, tail, amber, oval	1
115-1364	LIGHT, LED, stop (red) oval	REF
115-0869-002	GROMMET, oval	1
115-1364-001	LIGHT, LED, stop, red, oval	1
115-1373	LIGHT, LED, clearance (amber)	REF
115-0760-002	GROMMET, mount	1
115-1373-001	LIGHT, LED, clearance, amber, 2/1/2"	1

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All Units



SERVICE MANUAL

SECTION 8 THROTTLE, SPEED & TRANSMISSION KITS

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All Units

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SECTION 9
Body Controller

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SERVICE MANUAL

SECTION 9
Body Controller Hardware

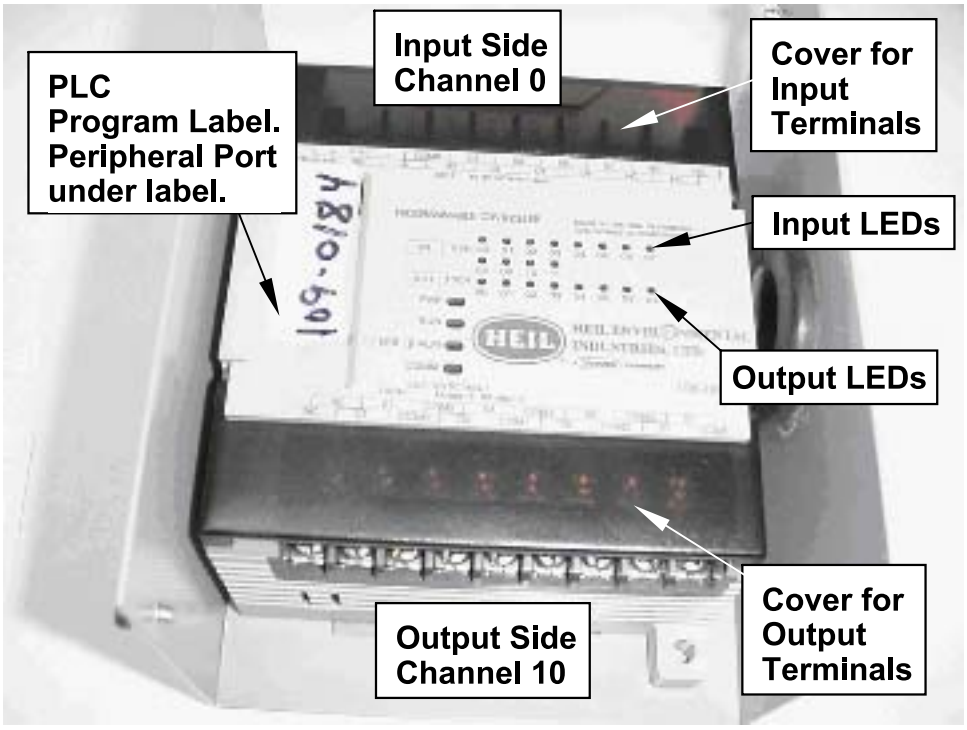
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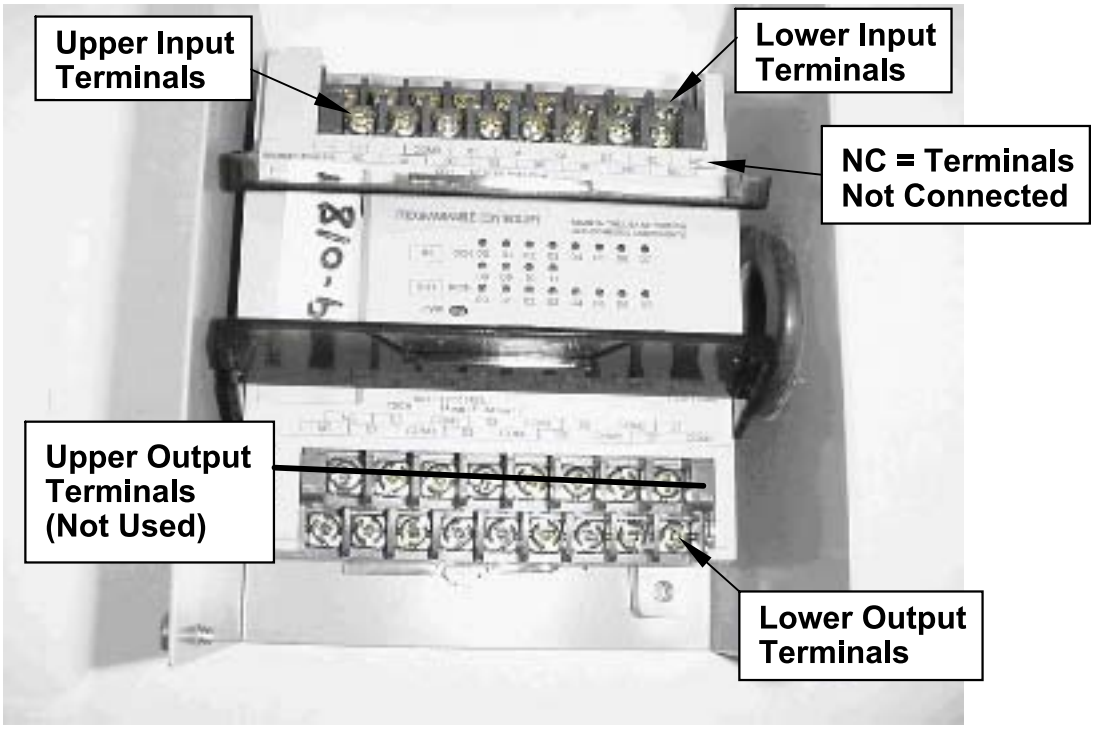
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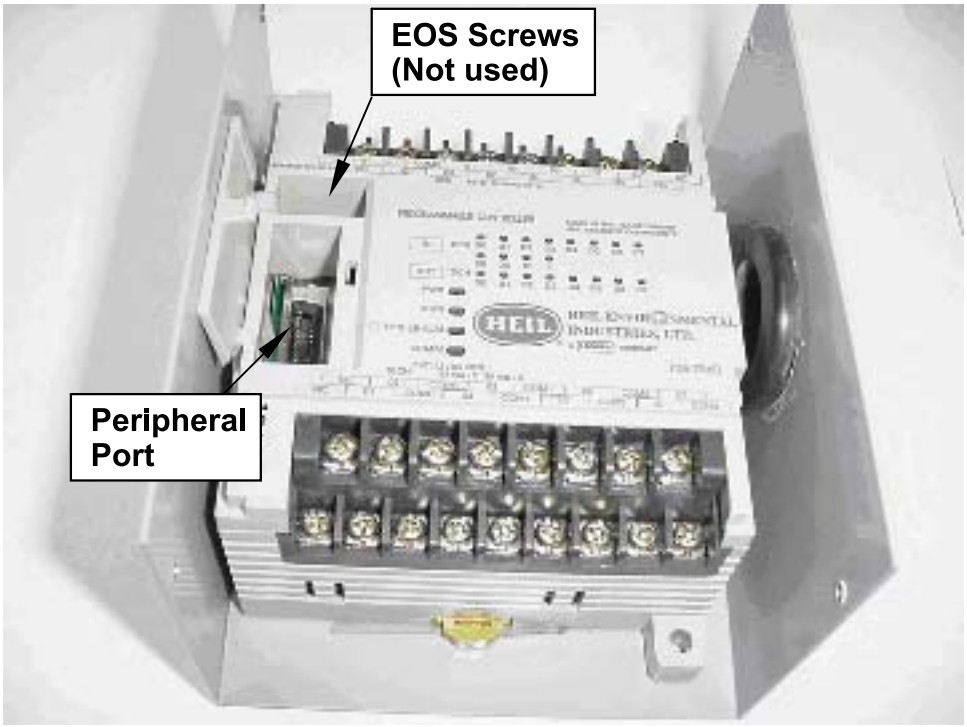
Mini PLC Assembly - Page 1



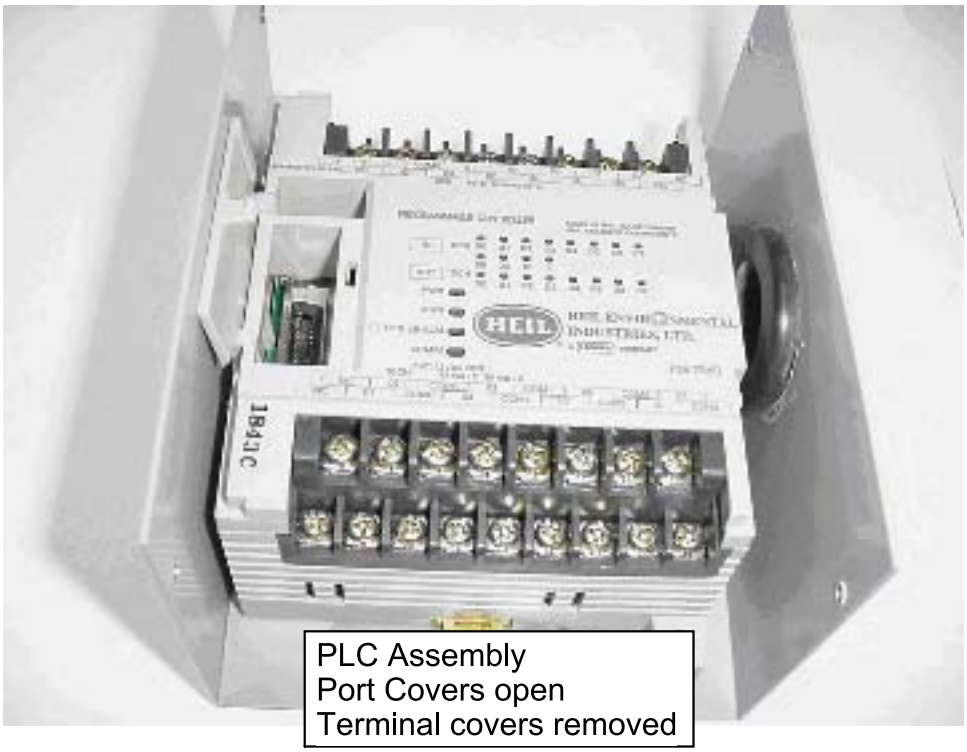


Mini PLC Assembly - Page 2





Mini PLC Assembly - Page 3



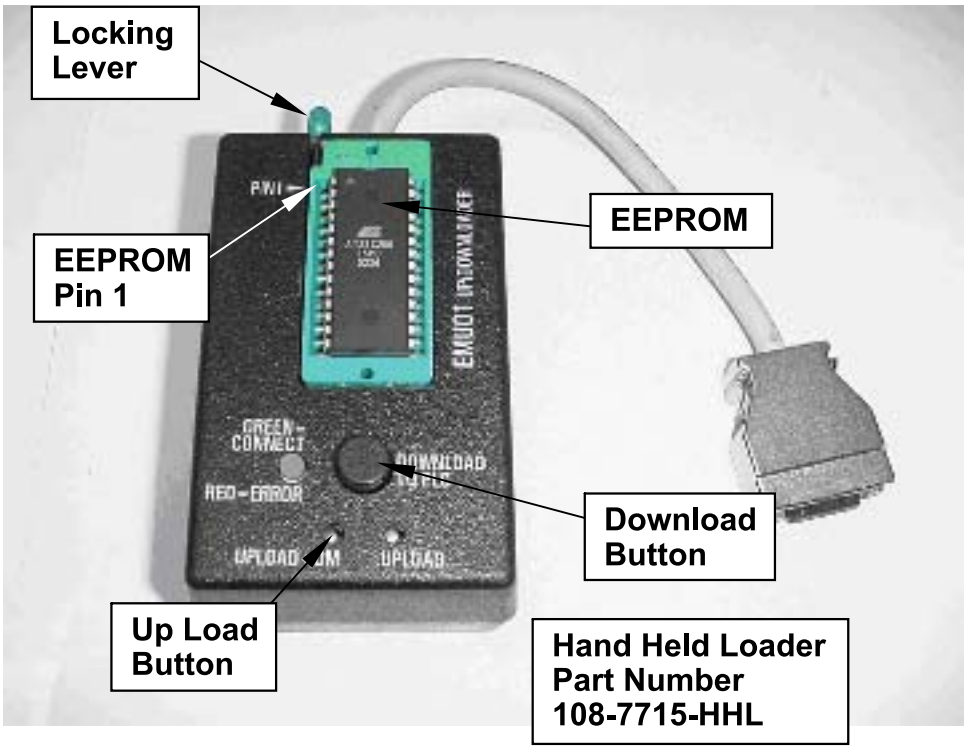
PLC Assembly
Port Covers open
Terminal covers removed

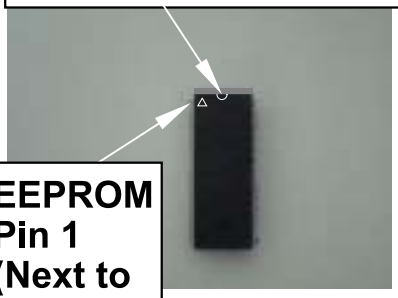
Various vehicle applications use the Mni PLC. These applications require two (2) Electronic Over Speeds (EOS). These applications generally use a tandem pump. The EOS set points are part of the PLC program, therefore you do not need the EOS screws.

The Mini PLC is a sourcing system that requires positive input signals.

The Mini PLC does not have a replaceable memory battery.

Mini PLC Assembly - Page 4





NOTE: Triangle and half-moon highlighted with white



Mini PLC Assembly - Page 5

Hand Held Loader Programming Procedures

Downloading Program to PLC

Use the instructions that follow to download a program from an EEPROM in the Hand held Loader (loader) into the PLC's memory.

1. Make sure you have an EEPROM (PN 108-7715-EEP) with the correct program,
2. Move the loader's locking lever UP.
3. Put the EEPROM in the loader (PN 108-7715-HHL) with EEPROM's Pin 1 in the Pin 1 slot of the loader.
4. Move the locking lever DOWN and make sure it locks. This secures the EEPROM in the loader.
5. Open the cover for the PLC's Peripheral Port and attach the loader's cable connector to the Peripheral Port.
6. Turn the igintiion power ON. The green light on the loader should be ON.
7. PRESS the DOWNLOAD TO PLC button once and wait for the green light to stop flashing.
8. Turn the ignition power OFF.
9. Wait 5 seconds and turn the ignition power ON again. The green light should be ON.
10. PRESS the DOWNLOAD TO PLC button again and wait for the green light to stop flashing.
11. Turn the ignition power OFF.
12. Remove the loader's cable connector from the Peripheral Port and close the Peripheral Port's cover.
13. Program installation is complete.

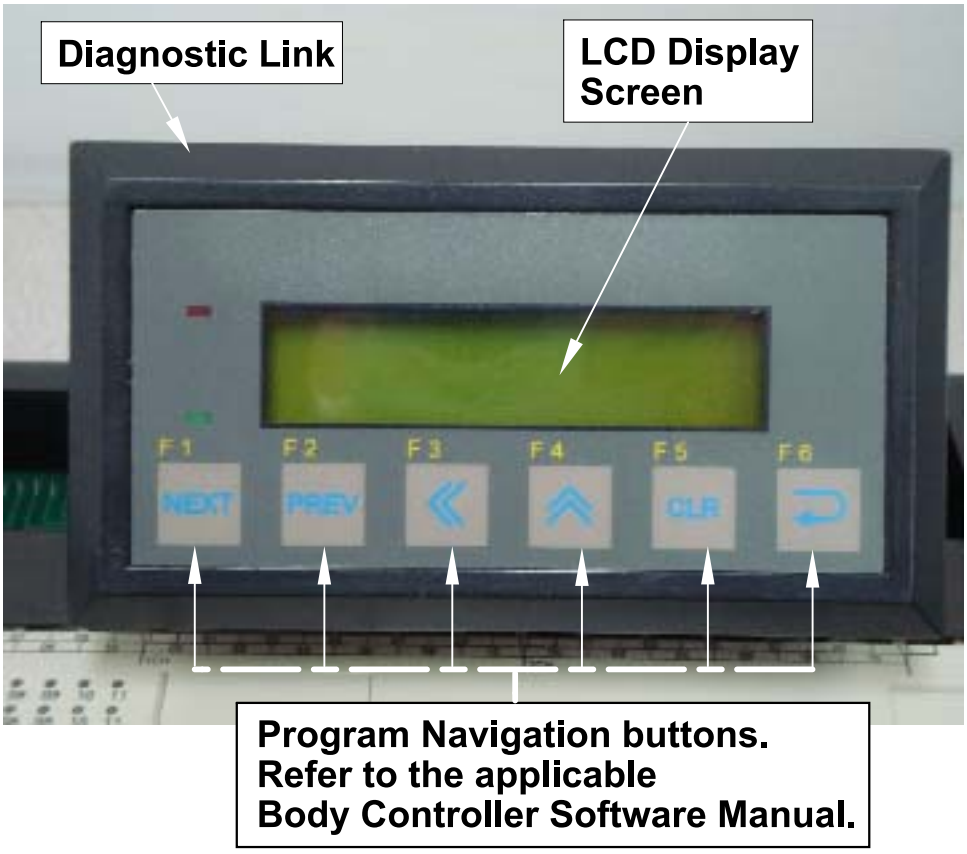
Uploading Program to Hand Held Loader

Use the instructions that follow to upload a program from the PLC's memory to an EEPROM in the loader.

1. Make sure you have a blank EEPROM.
2. Move the loader's locking lever UP.
3. Put the EEPROM in the loader with the EEPROM's Pin 1 in the Pin 1 slot of the loader.
4. Move the locking lever DOWN and make sure it locks. This secures the EEPROM in the loader.
5. Open the cover for the PLC's Peripheral Port and attach the loader's cable connector to the Peripheral Port.
6. Turn the ignition power ON. The green light on the loader should be ON.
7. PRESS the UPLOAD + DM button once and wait for the green light to stop flashing.
8. Turn the ignition power OFF.
9. Remove the loader's cable connector from the Peripheral Port and close the Peripheral Port's cover.
10. The upload of the PLC's program to the loader's EEPROM is complete.

NOTE: There is no memory in the loader without an EEPROM installed in the loader.

Mini PLC Assembly - Page 6



The Diagnostic Link (PN 108-7715-DIS) is a hand-held tool that connects to the PLC's Peripheral Port with a Communication Cable (PN 108-7715-CAB).

Refer to the applicable Body Controller Software manual for the specific instructions for a PLC program.

You use the Diagnostic Link to:

Perform the calibration setup for a newly installed PLC (*password required*)
Monitor input status
Monitor output status
Test output device circuits by forcing outputs to ON
View system parameters (*password required*)
View faults
View fault history.

Mini PLC - Pack on the Fly



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SECTION 9
Body Controller Software Program 109-0201

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Program 109-0201 Rear Loader Pack On The Fly

PURPOSE

The purpose of this document is to detail the operation of the Pack on the Fly Programable Logic Controller for rear loaders.

Revision History

REVISION	DATE	DESCRIPTION
Initial	12/19/08	Initial Release of documentation

1.01 OUTPUT CHART

Chart below shows PLC output and functions.

OUTPUTS POWERED	EOS FUNCTION
10.01	Pump #1
10.03	Pump #2
10.05	Not Used
10.07	Not Used

Display only outputs (i.e. not connected to the "real world".)

OUTPUTS NON-POWERED	FUNCTION
10.00	Not Used
10.02	Engine Speed Fault
10.04	Not Used
10.06	Calibration Set Indicator

1.02 INPUT CHART

Chart below shows PLC input and functions.

INPUTS POWERED	EOS FUNCTION
0.00	Alternator Input
0.01	Tach Calibration Input #1
0.02	Tach Calibration Input #2
0.03	Not used
0.04	High Flow Request
0.05	Low Torque Pressure Switch
0.06	Not used
0.07	Not used

2.0 Inputs

- **0.00 Alternator "R" Stator** - This Input monitors the Engine Speed via the Alternator R Stator Pulse. The R Stator Pulse typically is a –1.4-volt minimum to +15 volt maximum square wave of which the frequency varies relative to engine speed. The engine RPM is determined by counting the pulses of the Square wave and scaling ratio to engine speed. The alternator signal voltage should read 6.5 – 7 volts at the 0.00 input terminal with a digital volt ohmmeter.

- **0.01 Tach Cal Input 1 -** This input is used to program PLC for EOS settings ONLY! ***Not used during normal operation.***

- **0.02 Tach Cal Input 2 -** This input is used to program PLC for EOS settings ONLY! ***Not used during normal operation.***

- **0.03 Not Used**– No Connection

- **0.04 High Flow** – This Input monitors the high flow request switches. These switches are the equivalent switches used for throttle advance on throttle advance equipped unit. This is a momentary switch located on the left front corner of the body, a limit switch operating off the control rods, and optional switches located in the rear control stations.

- **0.05 Pressure Switch -** This Input monitors the low torque pressure switch. The pressure switch will provide a +12 volt signal when the switch set point is exceeded. ***This input will turn off pump 2.***

- **0.06 Not Used** – No Connection.

- **0.07 Not Used** – No Connection.

3.0 OUTPUTS

10.01 Pump P1 - This output operates Pump P1. This pump will only operate at rpms less than 1000. A high transmission temp signal or a low torque pressure switch signal will disconnect this pump.

Conditions Necessary to Turn 10.01 "ON"

Function or Component	Status	I/O #
A. Alternator	Good	0.00 (See note)
B. Low Torque switch	Off	0.05
C. Tailgate Slide Switch (Throttle Adv.)	On	0.04

Note: With the above conditions met 10.01 will turn on when:

1. Pump switch is on.
2. Engine speed is greater than 550 RPM (below 333 RPM is an engine speed fault), below 800 RPM to engage and will disengage at 1000 RPM.
3. The low torque pressure switch is below its set point.

10.03 Pump P2 - This output operates Pump P2. This pump will engage up to 1800 rpm and disengage at 2000 rpm. A high transmission temp signal or an engine droop signal will disconnect this pump.

Conditions Necessary to Turn 10.03 "ON"

Function or Component	Status	I/O #
A. Alternator	Good	0.00 (See note)

Note: With the above conditions met 10.03 will turn on when:

1. Pump switch is on.
2. Engine speed is greater than 550 rpm (below 333 RPM is an engine speed fault), below 1800 RPM to engage and will disengage at 2000 RPM.

10.06 Calibration Indicator - This output is a display only output and does not connect to the "real world". It indicates the PLC is in calibration mode. It is not used in normal operation

Conditions Necessary to Turn 10.07 "ON"

Function or Component	Status	I/O #
A. Calibration input 1	On	0.01
B. Calibration input 2	On	0.02

Program 109-0201 Rear Loader Pack On The Fly

Note: The PLC is placed in calibration mode by jumping a +12 volt signal to input 0.01 and 0.02. After 10 seconds the R-stator signal is stored into the PLC memory and used to calculate engine speed. The engine speed must be held at 1000 rpms for 10 seconds. Output 10.06 will be on after the 10 seconds have elapsed and will remain on until the power on inputs 0.01 or 0.02 is removed.



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Program 109-0205-001

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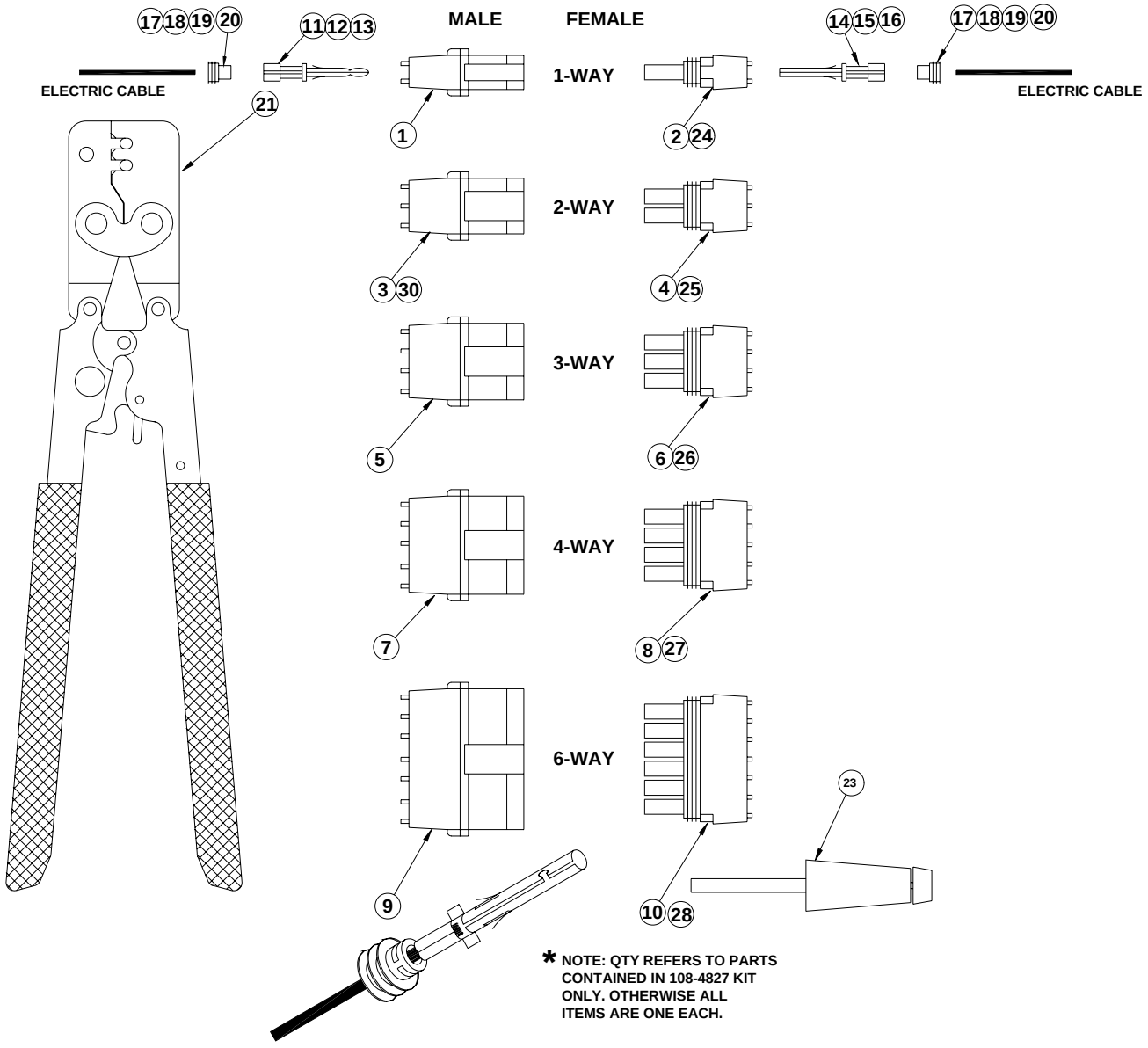
Packard Connection Kit 1002
Connectors, Plugs, Pins and Accessories for Deutsch Electrical Parts 1004
Deutsch Connection Kit 1008
Deutsch DT Series Connector Kits 1009
Deutsch DT Series Connector Kits – Boots 1010
Deutsch DT Series Connector Kits – Straight 1011
Deutsch DT Series Connector Kits – Straight 1012
Deutsch DT Series Connector Kits - 90° 1013

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PACKARD CONNECTION KIT

108-4827



* NOTE: QTY REFERS TO PARTS CONTAINED IN 108-4827 KIT ONLY. OTHERWISE ALL ITEMS ARE ONE EACH.

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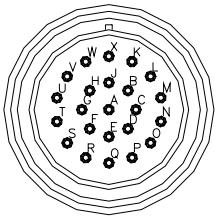
REF	PART NO.	DESCRIPTION	REQ'D
-	108-4827	KIT, Packard connection	REF
1	108-4827-001	CONNECTION, 1-way male	20
2	108-4827-002	CONNECTION, 1-way female	20
3	108-4827-003	CONNECTION, 2-way male	20
4	108-4827-004	CONNECTION, 2-way female	20
5	108-4827-005	CONNECTION, 3-way male	20
6	108-4827-006	CONNECTION, 3-way female	20
7	108-4827-007	CONNECTION, 4-way male	20
8	108-4827-008	CONNECTION, 4-way female	20
9	108-4827-009	CONNECTION, 6-way male	20
10	108-4827-010	CONNECTION, 6-way female	20
11	108-4827-110	TERMINAL, male (18-20 AWG)	60
12	108-4827-111	TERMINAL, male (16-14 AWG)	200
13	108-4827-112	TERMINAL, male (10-12 AWG)	60
14	108-4827-120	TERMINAL, female (18-20 AWG)	60
15	108-4827-121	TERMINAL, female (16-14 AWG)	200
16	108-4827-122	TERMINAL, female (10-12 AWG)	60
17	108-4827-130	SEAL, cable – (20 GA)	20
18	108-4827-131	SEAL, cable – (18 GA)	100
19	108-4827-132	SEAL, cable – (16-14 GA)	400
20	108-4827-133	SEAL, cable – (12 GA)	100
21	108-4827-134	PLUG, cavity	20
22	108-4828-001	TOOL, installation	1
23	108-4828-002	TOOL, removal	1
24	108-4827-014	SEAL, 1-way female connection	A/R
25	108-4827-015	SEAL, 2-way female connection	A/R
26	108-4827-016	SEAL, 3-way female connection	A/R
27	108-4827-017	SEAL, 4-way female connection	A/R
28	108-4827-018	SEAL, 6-way female connection	A/R
29	108-4827-200	GREASE, trucklite NYK	A/R
30	108-4827-010	CONNECTION, 2-way male	A/R

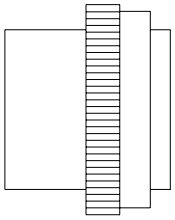
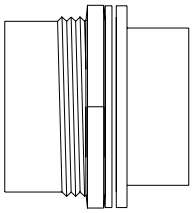
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CONNECTORS, PLUGS, PINS AND ACCESSORIES FOR DEUTSCH ELECTRICAL PARTS

108-4815



PINS AND SOCKETS

108-4815-101	PIN (6 GA)
108-4815-102	SOCKET (6 GA)
108-4815-103	SEALING PLUG (6 GA)
108-4815-104	PIN (8-10 GA)
108-4815-105	SOCKET (8-10 GA)
108-4815-106	SEALING PLUG (8-10 GA)
108-4815-107	PIN (12-14 GA)
108-4815-108	SOCKET (12-14 GA)
108-6461-100	SEALING PLUG (12-14 GA)
108-4815-110	PIN (16-18 GA)
108-4515-111	SOCKET (16-18 GA)
108-6461-100	SEALING PLUG (16-18 GA)
108-4815-112	PIN (20-24 GA)
108-4815-113	SOCKET (20-24 GA)
108-4815-114	SEALING PLUG (20-24 GA)

GOLD PINS & SOCKETS

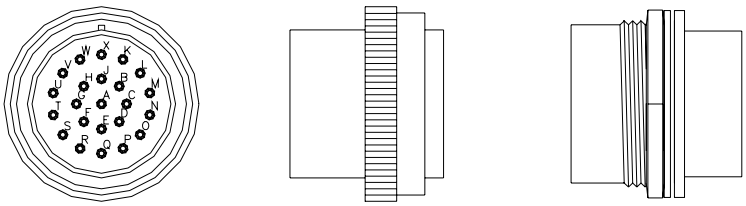
108-4815-120	PIN (12-14 GA)
108-4815-121	SOCKET (12-14 GA)
108-4815-124	PIN (14-16 GA)
108-4815-125	SOCKET (14-16 GA)
108-4815-122	PIN (16-18 GA)
108-4815-123	SOCKET (16-18 GA)
108-4815-126	PIN (20-24 GA)
108-4815-127	SOCKET (20-24 GA)

METAL CONNECTOR SHELLS

108-4815-001	21 (PIN) RECEPTACLE
108-4515-002	21 (SOCKET) PLUG
108-4815-003	31 (PIN) RECEPTACLE
108-4815-004	31 (SOCKET) PLUG
108-4815-005	23 (PIN) RECEPTACLE
108-4815-006	23 (SOCKET) PLUG
108-4815-007	16 (PIN) RECEPTACLE
108-4815-008	16 (SOCKET) PLUG
108-4815-009	14 (PIN) RECEPTACLE (16 GA)
108-4515-010	14 (SOCKET) PLUG (16 GA)
108-4815-015	35 (PIN) RECEPTACLE (3-16 GA, 32-20 GA)
108-4815-016	35 (SOCKET) PLUG (3-16 GA, 32-20 GA)
108-4815-017	8 (PIN) RECEPTACLE (12 GA)
108-4815-018	8 (SOCKET) PLUG (12 GA)

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PLASTIC CONNECTOR SHELLS

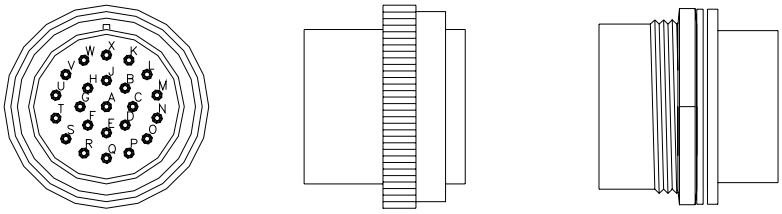
108-4815-020	21-PIN RECEPTACLE
108-4815-021	21-PIN SOCKET
108-4815-022	19-PIN RECEPTACLE
108-4815-023	19-PIN SOCKET
108-4815-024	23-PIN RECEPTACLE
108-4815-025	23-PIN SOCKET
108-4815-030	31 PIN RECEPTACLE
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108-4815-032	16 PIN PLUG
108-4815-033	16 SOCKET RECEPTACLE
108-4815-034	16 PIN RECEPTACLE
108-4815-035	16 SOCKET RECEPTACLE
108-4815-036	16 PIN RECEPTACLE
108-4815-037	29 PIN RECEPTACLE
108-4815-038	9 SOCKET RECEPTACLE
108-4815-067	23 SOCKET PLUG WITH RING ADAPTOR
108-4815-068	29 SOCKET PLUG WITH RING ADAPTOR
108-4815-069	9 SOCKET PLUG WITH RING ADAPTOR
108-4815-070	8 PIN RECEPTACLE (12-16)
108-4815-071	8 PIN PLUG (12-16)
108-4815-182	21 PIN RECEPTACLE
108-4815-183	21 SOCKET PLUG
108-4815-184	19 PIN RECEPTACLE
108-4815-185	19 PIN PLUG

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108-4815-151	LOCKWASHER, 24 SHELL
108-4815-152	STRAIN RELIEF STRAIGHT 24
108-4815-153	STRAIN RELIEF 90° 24
108-4815-154	PANEL NUT, 18 SHELL
108-4815-155	LOCKWASHER, 18 SHELL
108-4815-156	STRAIN RELIEF STRAIGHT 18
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108-4815-158	REMOVAL TOOL (6 GA)
108-4815-159	REMOVAL TOOL (8-10 GA)
108-4815-160	REMOVAL TOOL (12-14 GA)
108-4815-161	REMOVAL TOOL (16-18 GA)
108-4815-162	REMOVAL TOOL (20-24 GA)
108-4815-163	CRIMP TOOL (12-24 GA)
108-4815-164	CRIMP TOOL (6-10 GA)
108-4815-165	RECEPTACLE CAP. 18 PIN
108-4815-166	RECEPTACLE CAP, 24 PIN
108-4815-167	PLUG CAP, 18 PIN
108-4815-168	PLUG CAP, 24 PIN

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ACCESSORIES - Continued

108-4815-169	****
108-4815-170	DT SCREWDRIVER TOOL
108-4815-180	PANEL NUT, 18 SHELL
108-4815-181	LOCKWASHER, 18 SHELL
108-4815-186	BACKSHELL, 90º, 24 SHELL
108-4815-187	BACKSHELL, STRAIGHT, 24
108-4815-188	LG COMPRESSION BACKSHELL
108-4815-189	LG COMPRESSION NUT
108-4815-190	SM COMPRESSION BACKSHELL
108-4815-191	SM COMPRESSIONS NUT

METAL CONNECTOR SHELLS

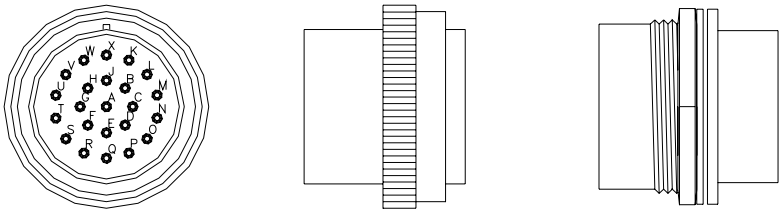
108-4815-001	21 (PIN) RECEPTACLE
108-4515-002	21 (SOCKET) PLUG
108-4815-003	31 (PIN) RECEPTACLE
108-4815-004	31 (SOCKET) PLUG
108-4815-005	23 (PIN) RECEPTACLE
108-4815-006	23 (SOCKET) PLUG
108-4815-007	16 (PIN) RECEPTACLE
108-4815-008	16 (SOCKET) PLUG
108-4815-009	14 (PIN) RECEPTACLE (16 GA)
108-4515-010	14 (SOCKET) PLUG (16 GA)
108-4815-015	35 (PIN) RECEPTACLE (3-16 GA, 32-20 GA)
108-4815-016	35 (SOCKET) PLUG (3-16 GA, 32-20 GA)
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METAL CONNECTOR KITS WITH NORMAL WIRE SEALS (GREEN RING)

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108-4815-012	14 SOCKET PLUG KIT (16 GA)
108-4815-013	14 PIN RECEPTACLE WITH STRAIN KIT (16 GA)
108-4815-014	14 SOCKET PLUG WITH STRAIN KIT (16 GA)
108-4815-052	35 PIN RECEPTACLE (16/20) KIT
108-4815-053	35 SOCKET PLUG (16/20) KIT
108-4815-054	35 PIN RECEPTACLE (16/20) WITH STRAIN KIT
108-4815-055	35 SOCKET PLUG (16/20) WITH STRAIN KIT
108-4815-056	21 PIN RECEPTACLE (12/16) KIT
108-4815-057	21 SOCKET PLUG (12/16) KIT
108-4815-058	21 PIN RECEPTACLE (12/16) WITH STRAIN KIT
108-4815-059	21 SOCKET PLUG (12/16 GA) WITH STRAIN KIT
108-4815-064	9 PIN RECEPTACLE KIT (4/8/12 GA)
108-4815-065	9 SOCKET PLUG KIT (4/8/12 GA)
108-4815-066	9 PIN RECEPTACLE WITH STRAIN KIT (4/8/12 GA)

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METAL CONNECTOR KITS WITH EXTRA THIN WIRE SEALS (BLUE RING)

108-4815-60	31 PIN RECEPTACLE (16) KIT
108-4815-61	31 SOCKET PLUG (16) KIT
108-4815-62	31 PIN RECEPTACLE (16) WITH STRAIN KIT
108-4815-63	31 SOCKET PLUG (16 WITH STRAIN KIT

METAL CONNECTOR KITS WITH EXTRA THIN WALL WIRE SEALS (BLUE RING

108-4815-040	21 PIN RECEPTACLE (12/16) KIT
108-4815-041	21 SOCKET PLUG (12/16 GA) KIT
108-4815-042	21 PIN RECEPTACLE 12/16) WITH STRAIN KIT
108-4815-043	21 SOCKET PLUG (12/16 GA) WITH STRAIN KIT

METAL CONNECTOR KITS WITH NORMAL WIRE SEALS (BLUE RING

108-4815-044	23 PIN RECEPTACLE (16 GA) KIT
108-4815-045	23 SOCKET PLUG (16 GA) KIT
108-4815-046	23 PIN RECEPTACLE (16 GA) WITH STRAIN KIT
108-4815-047	23 SOCKET PLUG (16 GA) WITH STRAIN KIT
108-4815-048	31 PIN RECEPTACLE (16) KIT
108-4815-049	31 SOCKET PLUG (16 KIT
108-4815-050	31 PIN RECEPTACLE (16) WITH STRAIN KIT
108-4815-051	31 SOCKET PLUG (16) WITH STRAIN KIT

PLASTIC CONNECTOR KITS

108-4815-026	21 PIN RECEPTACLE KIT
108-4815-027	21 SOCKET PLUG KIT
108-4815-028	9 PIN RECEPTACLE KIT (4/8/12 GA)
108-4815-029	9 PIN RECEPTACLE KIT (4/8/12 GA)

KIT 108-4815 IS COMPRISED OF THE FOLLOWING:

- 108-4815-021
- 108-4815-121
- 108-4815-124
- 108-6461-100
- 108-4815-150
- 108-4815-151

KIT 108-4815-027 IS COMPRISED OF THE FOLLOWING:

- 108-4815-021
- 108-4815-121
- 108-4815-125
- 108-6461-100

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DEUTSCH CONNECTION KIT

108-6461-PC

REF	PART NO.	DESCRIPTION	REQ'D
-	108-6461-PC	KIT, Deutsch connection	REF
1	108-6461-003P	PLUG, 3-way	15
2	108-6461-003PW	WEDGE, 3-way plug	15
3	108-6461-003PB	BOOT, 3-way plug	15
4	108-6461-003R	RECEPTACLE, 3-way	15
5	108-6461-003RW	WEDGE, 3-way receptacle	15
6	108-6461-003RB	BOOT, 3-way receptacle	15
7	108-6461-004P	PLUG, 4-way	3
8	108-6461-004PW	WEDGE, 4-way plug	3
9	108-6461-004PB	BOOT, 4-way plug	3
10	108-6461-004R	RECEPTACLE, 4-way	3
11	108-6461-004RW	WEDGE, 4-way receptacle	3
12	108-6461-004RB	BOOT, 4-way receptacle	3
13	108-6461-006P	PLUG, 6-way	3
14	108-6461-006PW	WEDGE, 6-way plug	3
15	108-6461-006PB	BOOT, 6-way plug	3
16	108-6461-006R	RECEPTACLE, 6-way	3
17	108-6461-006RW	WEDGE, 6-way receptacle	3
18	108-6461-006RB	BOOT, 6-way receptacle	3
19	108-6461-008P	PLUG, 8-way	9
20	108-6461-008PW	WEDGE, 8-way plug	9
21	108-6461-008PB	BOOT, 8-way plug	9
22	108-6461-008R	RECEPTACLE, 8-way	9
23	108-6461-008RW	WEDGE, 8-way receptacle	9
24	108-6461-008RB	BOOT, 8-way receptacle	9
25	108-6461-012P	PLUG, 12-way	3
26	108-6461-CPW	WEDGE, 12-way plug	3
27	108-6461-CPB	BOOT, 12-way boot	3
28	108-6461-012R	RECEPTACLE, 12-way	3
29	108-6461-CRW	WEDGE, 12-way receptacle	3
30	108-6461-CRB	BOOT, 12-way receptacle	3
31	108-6461-100	PLUG, sealing	25
32	108-6461-101	PIN, gold plated	200
33	108-6461-102	SOCKET, gold plated	200
34	108-6461-200	CRIMPER, production	1
35	108-6461-201	CRIMPER, field kit	1
36	108-6461-202	REMOVAL TOOL	1

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DEUTSCH DT SERIES CONNECTOR KITS

108-8411

REF	PART NO.	DESCRIPTION	REQ'D
-	108-8411	KITS, Deutsch connector, DT series	REF
1	108-8411-001	KIT, Deutsch connector, DT series	REF
	108-8411-02R	RECEPTACLE, 2-way	1
	108-4815-120	PIN, gold 12 AWG	2
	108-8411-2RW	RECEPTACLE, 2-way wedge	1
	108-6461-100	PLUG, sealing	2
	108-8411-2RB	BOOT, receptacle	1
2	108-8411-002	KIT, Deutsch connector, DT series	REF
	108-8411-02P	PLUG, 2-way	1
	108-4815-121	PIN, gold 12 AWG	2
	108-8411-2PW	PLUG, 2-way wedge	1
	108-6461-100	PLUG, sealing	2
	108-8411-2RB	BOOT, plug	1
3	108-8411-003	KIT, Deutsch connector, DT series	REF
	108-8411-04R	RECEPTACLE, 4-way	1
	108-4815-120	PIN, gold 12 AWG	4
	108-8411-4RW	RECEPTACLE, 4-way wedge	1
	108-6461-100	PLUG, sealing	2
	108-8411-4RB	BOOT, receptacle	1
4	108-8411-004	KIT, Deutsch connector, DT series	REF
	108-8411-04P	PLUG, 4-way	1
	108-4815-121	PIN, gold 12 AWG	4
	108-8411-4PW	PLUG, 4-way wedge	1
	108-6461-100	PLUG, sealing	2
	108-8411-4PB	BOOT, plug	1
5	108-8411-005	KIT, Deutsch connector, DT series	REF
	108-8411-22R	RECEPTACLE, 2-way mounted	1
	108-4815-120	PIN, gold 12 AWG	2
	108-8411-2RW	RECEPTACLE, 2-way wedge	1
	108-6461-100	PLUG, sealing	2
	108-8411-2RB	BOOT, receptacle	1
6	108-8411-006	KIT, Deutsch connector, DT series	REF
	108-8411-24R	RECEPTACLE, 4-way mounted	1
	108-4815-120	PIN, gold 12-AWG	4
	108-8411-4RW	RECEPTACLE, 4-way wedge	1
	108-6461-100	PLUG, sealing	2
	108-8411-4RB	BOOT, receptacle	1

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DEUTSCH DT SERIES CONNECTOR KITS – BOOTS

108-6461

REF	PART NO.	DESCRIPTION	REQ'D
-	108-6461	KITS, Deutsch connection, DT series	REF
1	108-6461-3PB	BOOT, 3-way plug	A/R
2	108-6461-3RB	BOOT, 3-way receptacle	A/R
3	108-6461-4PB	BOOT, 4-way plug	A/R
4	108-6461-4RB	BOOT, 4-way receptacle	A/R
5	108-6461-6PB	BOOT, 6-way plug	A/R
6	108-6461-6RB	BOOT, 6-way receptacle	A/R
7	108-6461-8PB	BOOT, 8-way plug	A/R
8	108-6461-8RB	BOOT, 8-way receptacle	A/R
9	108-6461-CPB	BOOT, 12-way plug	A/R
10	108-6461-CRB	BOOT, 12-way receptacle	A/R
11	108-6461-2PB	BOOT, 2-way plug	A/R
12	108-6461-2RB	BOOT, 2-way receptacle	A/R

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DEUTSCH DT SERIES CONNECTOR KITS – STRAIGHT

108-6461

REF	PART NO.	DESCRIPTION	REQ'D
-	108-6461	KITS, Deutsch connector, DT series	REF
1	108-6461-001	KIT, Deutsch connector, DT series, straight	REF
	108-6461-03P	PLUG, 3-way	1
	108-6461-3PW	PLUG, 3-way wedge	1
	108-6461-102	SOCKET, gold plated	3
	108-6461-100	PLUG, sealing	2
	108-6461-027	PLUG, 3-way straight backshell	1
2	108-6461-002	KIT, Deutsch connector, DT series, straight	REF
	108-6461-03R	RECEPTACLE, 3-way	1
	108-6461-3RW	RECEPTACLE, 3-way wedge	1
	108-6461-101	PIN, gold plated	3
	108-6461-100	PLUG, sealing	2
	108-6461-015	RECEPTACLE, 3-way straight backshell	1
3	108-6461-003	KIT, Deutsch connector, DT series, straight	REF
	108-6461-04P	PLUG, 4-way	1
	108-6461-4PW	PLUG, 4-way wedge	1
	108-6461-102	SOCKET, gold plated	4
	108-6461-100	PLUG, sealing	1
	108-6461-029	PLUG, 4-way straight backshell	1
4	108-6461-004	KIT, Deutsch connector, DT series, straight	REF
	108-6461-04R	RECEPTACLE, 4-way	1
	108-6461-4RW	RECEPTACLE, 4-way wedge	1
	108-6461-101	PIN, gold plated	4
	108-6461-100	PLUG, sealing	1
	108-6461-017	RECEPTACLE, 4-way straight backshell	1
5	108-6461-005	KIT, Deutsch connector, DT series, straight	REF
	108-6461-06P	PLUG, 6-way	1
	108-6461-6PW	PLUG, 6-way wedge	1
	108-6461-102	SOCKET, gold plated	6
	108-6461-100	PLUG, sealing	1
	108-6461-031	PLUG, 6-way straight backshell	1
6	108-6461-006	KIT, Deutsch connector, DT series, straight	REF
	108-6461-06R	RECEPTACLE, 6-way	1
	108-6461-6RW	RECEPTACLE, 6-way wedge	1
	108-6461-101	PIN, gold plated	6
	108-6461-100	PLUG, sealing	1
	108-6461-019	RECEPTACLE, 6-way straight backshell	1
7	108-6461-007	KIT, Deutsch connector, DT series, straight	REF
	108-6461-08P	PLUG, 8-way	1
	108-6461-08PW	PLUG, 8-way wedge	1
	108-6461-102	SOCKET, gold plated	8
	108-6461-100	PLUG, sealing	1
	108-6461-033	PLUG, 8-way straight backshell	1

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DEUTSCH DT SERIES CONNECTOR KITS – STRAIGHT

108-6461 – Continued

REF	PART NO.	DESCRIPTION	REQ'D
-	108-6461	KITS, Deutsch connector, DT series	REF
8	108-6461-008	KIT, Deutsch connector, DT series, straight	REF
	108-6461-08R	RECEPTACLE, 8-way	1
	108-6461-8RW	RECEPTACLE, 8-way wedge	1
	108-6461-101	PIN, gold plated	8
	108-6461-100	PLUG, sealing	1
	108-6461-021	RECEPTACLE, 8-way straight backshell	1
9	108-6461-009	KIT, Deutsch connector, DT series, straight	REF
	108-6461-12P	PLUG, 12-way	1
	108-6461-CPW	PLUG, 12-way wedge	1
	108-6461-102	SOCKET, gold plated	12
	108-6461-100	PLUG, sealing	3
	108-6461-035	PLUG, 12-way straight backshell	1
10	108-6461-010	KIT, Deutsch connector, DT series, straight	REF
	108-6461-12R	RECEPTACLE, 12-way	1
	108-6461-CRW	RECEPTACLE, 12-way wedge	1
	108-6461-101	PIN, gold plated	12
	108-6461-100	PLUG, sealing	3
	108-6461-023	RECEPTACLE, 12-way straight backshell	1
11	108-6461-011	KIT, Deutsch connector, DT series, straight	REF
	108-6461-02P	PLUG, 2-way	1
	108-6461-2PW	PLUG, 2-way wedge	1
	108-6461-102	SOCKET, gold plated	2
	108-6461-100	PLUG, sealing	1
	108-6461-025	PLUG, 2-way straight backshell	1
12	108-6461-012	KIT, Deutsch connector, DT series, straight	REF
	108-6461-02R	RECEPTACLE, 2-way	1
	108-6461-2RW	RECEPTACLE, 2-way wedge	1
	108-6461-101	PIN, gold plated	2
	108-6461-100	PLUG, sealing	1
	108-6461-013	RECEPTACLE, 2-way straight backshell	1
13	108-7142	KIT, 12-way panel mount receptacle	REF

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DEUTSCH DT SERIES CONNECTOR KITS - 90°

108-6461

REF	PART NO.	DESCRIPTION	REQ'D
-	108-6461	KITS, Deutsch connector, DT series	REF
1	108-6461-041	KIT, Deutsch connector, DT series, 90º	REF
	108-6461-03P	PLUG, 3-way	1
	108-6461-3PW	PLUG 3-way wedge	1
	108-6461-102	SOCKET, gold plated	3
	108-6461-100	PLUG, sealing	2
	108-6461-028	PLUG, 3-way, 90º backshell	1
2	108-6461-042	KIT, Deutsch connector, DT series, 90º	REF
	108-6461-03R	RECEPTACLE, 3-way	1
	108-6461-3RW	RECEPTACLE, 3-way wedge	1
	108-6461-101	PIN, gold plated	3
	108-6461-100	PLUG, sealing	2
	108-6461-016	RECEPTACLE, 3-way 90º backshell	1
3	108-6461-043	KIT, Deutsch connector, DT series, 90º	REF
	108-6461-04P	PLUG, 4-way	1
	108-6461-4PW	PLUG, 4-way wedge	1
	108-6461-102	SOCKET, gold plated	4
	108-6461-100	PLUG, sealing	1
	108-6461-030	PLUG, 4-way 90º backshell	1
4	108-6461-044	KIT, Deutsch connector, DT series, 90º	REF
	108-6461-04R	RECEPTACLE, 4-way	1
	108-6461-4RW	RECEPTACLE, 4-way wedge	1
	108-6461-101	PIN, gold plated	4
	108-6461-100	PLUG, sealing	1
	108-6461-018	RECEPTACLE, 4-way 90º backshell	1
5	108-6461-045	KIT, Deutsch connector, DT series, 90º	REF
	108-6461-06P	PLUG, 6-way	1
	108-6461-6PW	PLUG, 6-way wedge	1
	108-6461-102	SOCKET, gold plated	6
	108-6461-100	PLUG, sealing	1
	108-6461-032	PLUG, 6-way 90º backshell	1
6	108-6461-046	KIT, Deutsch connector, DT series, 90º	REF
	108-6461-06R	RECEPTACLE, 6-way	1
	108-6461-6RW	RECEPTACLE, 6-way wedge	1
	108-6461-101	PIN, gold plated	6
	108-6461-100	PLUG, sealing	1
	108-6461-020	RECEPTACLE, 6-way 90º backshell	1
7	108-6461-047	KIT, Deutsch connector, DT series, 90º	REF
	108-6461-08P	PLUG, 8-way	1
	108-6461-8PW	PLUG, 8-way wedge	1
	108-6461-102	SOCKET, gold plated	8
	108-6461-100	PLUG, sealing	1
	108-6461-034	PLUG, 8-way 90º backshell	1

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REF	PART NO.	DESCRIPTION	REQ'D
-	108-6461	KITS, Deutsch connector, DT series	REF
8	108-6461-048	KIT, Deutsch connector, DT series, 90º	REF
	108-6461-08R	RECEPTACLE, 8-way	1
	108-6461-8RW	RECEPTACLE, 8-way wedge	1
	108-6461-101	PIN, gold plated	8
	108-6461-100	PLUG, sealing	1
	108-6461-022	RECEPTACLE, 8-way 90º backshell	1
9	108-6461-049	KIT, Deutsch connector, DT series, 90º	REF
	108-6461-12P	PLUG, 12-way	1
	108-6461-CPW	PLUG, 12-way wedge	1
	108-6461-102	SOCKET, gold plated	12
	108-6461-100	PLUG, sealing	3
	108-6461-036	PLUG, 12-way 90º backshell	1
10	108-6461-050	KIT, Deutsch connector, DT series, 90º	REF
	108-6461-12R	RECEPTACLE, 12-way	1
	108-6461-CRW	RECEPTACLE, 12-way wedge	1
	108-6461-101	PIN, gold plated	12
	108-6461-100	PLUG, sealing	3
	108-6461-024	RECEPTACLE, 12-way 90º backshell	1
11	108-6461-051	KIT, Deutsch connector, DT series, 90º	REF
	108-6461-02P	PLUG, 2-way	1
	108-6461-2PW	PLUG, 2-way wedge	1
	108-6461-102	SOCKET, gold plated	2
	108-6461-100	PLUG, sealing	1
	108-6461-026	PLUG, 2-way 90º backshell	1
12	108-6461-052	KIT, Deutsch connector, DT series, 90º	REF
	108-6461-02R	RECEPTACLE, 2-way	1
	108-6461-2RW	RECEPTACLE, 2-way wedge	1
	108-6461-101	PIN, gold plated	2
	108-6461-100	PLUG, sealing	1
	108-6461-014	RECEPTACLE, 2-way 90º backshell	1

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THROTTLE ADVANCE: NONE
ELECTRONIC OVERSPEED: 1350 RPM

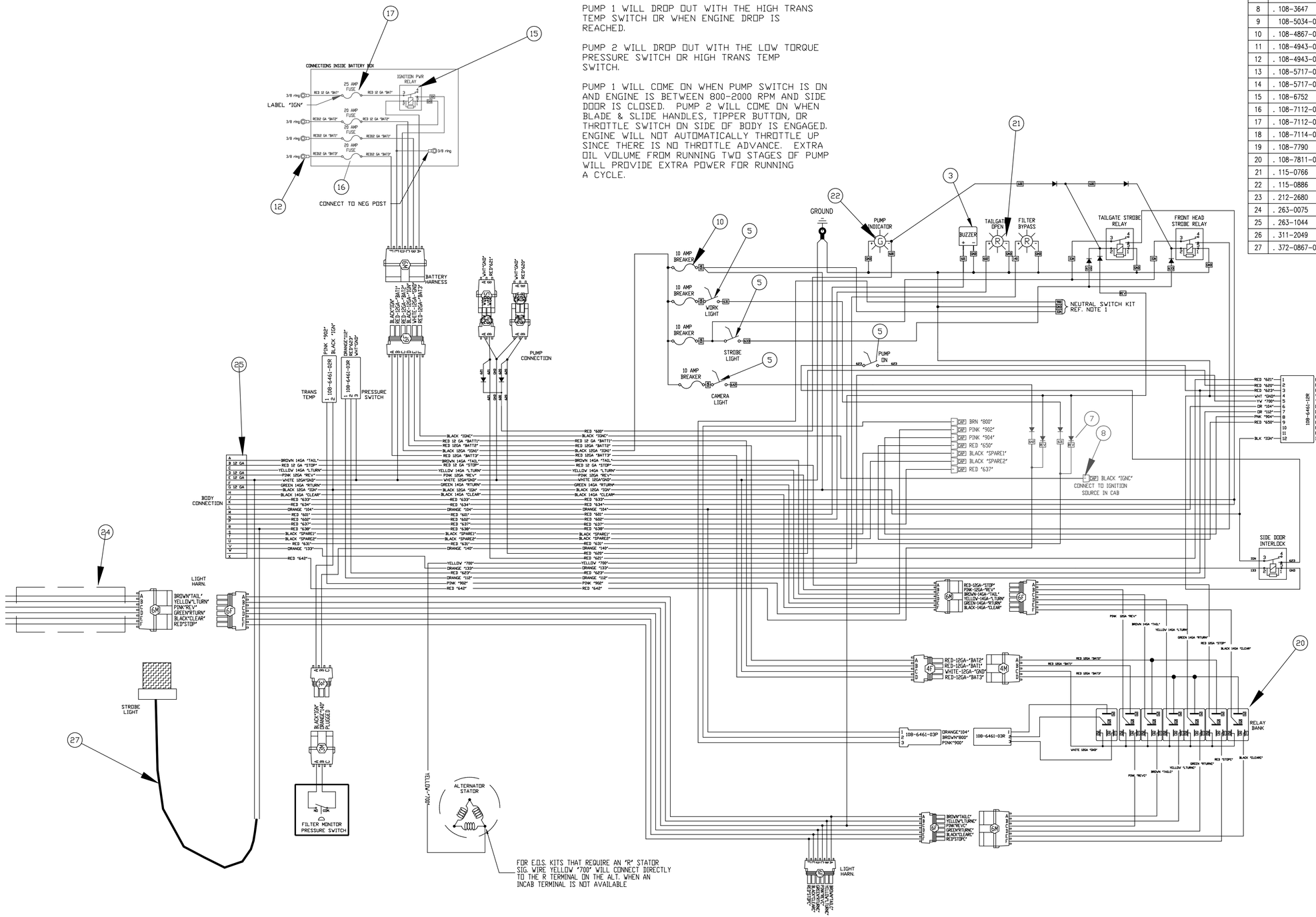
PUMP 1 MAX ENGAGEMENT SPEED: 1800 RPM
PUMP 1 MAX OPERATING SPEED: 2000 RPM
PUMP 2 MAX ENGAGEMENT SPEED: 800 RPM
PUMP 2 MAX OPERATING SPEED: 800 RPM
PUMP 1 COIL = WIRE RED "621"
PUMP 2 COIL = WIRE RED "620"

PUMP 1 WILL DROP OUT WITH THE HIGH TRANS TEMP SWITCH OR WHEN ENGINE DROP IS REACHED.

PUMP 2 WILL DROP OUT WITH THE LOW TORQUE PRESSURE SWITCH OR HIGH TRANS TEMP SWITCH.

PUMP 1 WILL COME ON WHEN PUMP SWITCH IS ON AND ENGINE IS BETWEEN 800-2000 RPM AND SIDE DOOR IS CLOSED. PUMP 2 WILL COME ON WHEN BLADE & SLIDE HANDLES, TIPPER BUTTON, OR THROTTLE SWITCH ON SIDE OF BODY IS ENGAGED. ENGINE WILL NOT AUTOMATICALLY THROTTLE UP SINCE THERE IS NO THROTTLE ADVANCE. EXTRA OIL VOLUME FROM RUNNING TWO STAGES OF PUMP WILL PROVIDE EXTRA POWER FOR RUNNING A CYCLE.

REF.	PART No.	DESCRIPTION	QTY.
1	. 054-7350	SHRINK TUBING	25"
2	. 069-0032	RELAY MICRO	3
3	. 108-0147	BUZZER	1
4	. 108-0880	1/4 SPADE	2
5	. 108-1814	TOGGLE SWITCH	5
6	. 108-2050	3/16 SPADE	6
7	. 108-2648	DIODE	9
8	. 108-3647	CLOSED END CONNECTOR	2
9	108-5034-003	LOOM, ELECTRICAL	12'
10	. 108-4867-005	CIRCUIT BREAKER 10 AMP	3
11	. 108-4943-003	RING TERMINAL #10	12
12	. 108-4943-006	RING TERMINAL 3/8"	5
13	. 108-5717-002	CONNECT BUTT NON INS 16-14	6
14	. 108-5717-003	CONN NON INSUL 12-10	5
15	. 108-6752	WEATHER PROOF RELAY ASSEM	2
16	. 108-7112-020	FUSE BLADE 20 AMP	3
17	. 108-7112-025	FUSE BLADE 25 AMP	1
18	. 108-7114-010	QDC BREAKER	8
19	. 108-7790	FUSE HOLDER W/COVER	4
20	. 108-7811-001	RELAY BANK	1
21	. 115-0766	LIGHT INDICATOR RED	2
22	. 115-0886	LIGHT GREEN	1
23	. 212-2680	DECAL, CONTROL	1
24	. 263-0075	HARNESS CHASSIS LIGHT	1
25	. 263-1044	HARNESS CAB TO BODY	1
26	. 311-2049	BRACKET CONTROL PANEL	1
27	. 372-0867-005	STROBE	1



CHASSIS & CAB ELECTRICAL SCHEMATIC - ALLIED - OPERATE-AT-IDLE
372-1797-002
01/03/08

CONNECTIONS INSIDE BATTERY BOX

IGNITION PWR RELAY

25 AMP FUSE

20 AMP FUSE

20 AMP FUSE

20 AMP FUSE

3/8 ring

LABEL "IGN"

CONNECT TO NEG POST

GROUND

PUMP INDICATOR

BUZZER

TAILGATE OPEN

FILTER BYPASS

TAILGATE STROBE RELAY

FRONT HEAD STROBE RELAY

10 AMP BREAKER

WORK LIGHT

STROBE LIGHT

CAMERA LIGHT

PUMP ON

NEUTRAL SWITCH KIT REF. NOTE 1

THROTTLE ADVANCE

BROWN "800" PLUGGED
WHITE "GND"

THROTTLE ADVANCE ASS'Y

108-6461-12R

WHITE W/BLACK "SPARE1"
WHITE W/BLACK "SPARE2"
RED "637"

BLACK "IGNC"
CONNECT TO IGNITION SOURCE IN CAB

ORANGE "133"

108-6461-03R

BLACK "IGN"
ORANGE "140"
PLUGGED

FILTER MONITOR PRESSURE SWITCH

ALTERNATOR STATOR

YELLOW "700"

FOR E.D.S. KITS THAT REQUIRE AN 'R' STATOR SIG. WIRE YELLOW "700" WILL CONNECT DIRECTLY TO THE R TERMINAL ON THE ALT. WHEN AN INCAB TERMINAL IS NOT AVAILABLE

BROWN "TAIL"
YELLOW "L'TURN"
PINK "REV"
GREEN "RTURN"
BLACK "CLEAR"
RED "STOP"

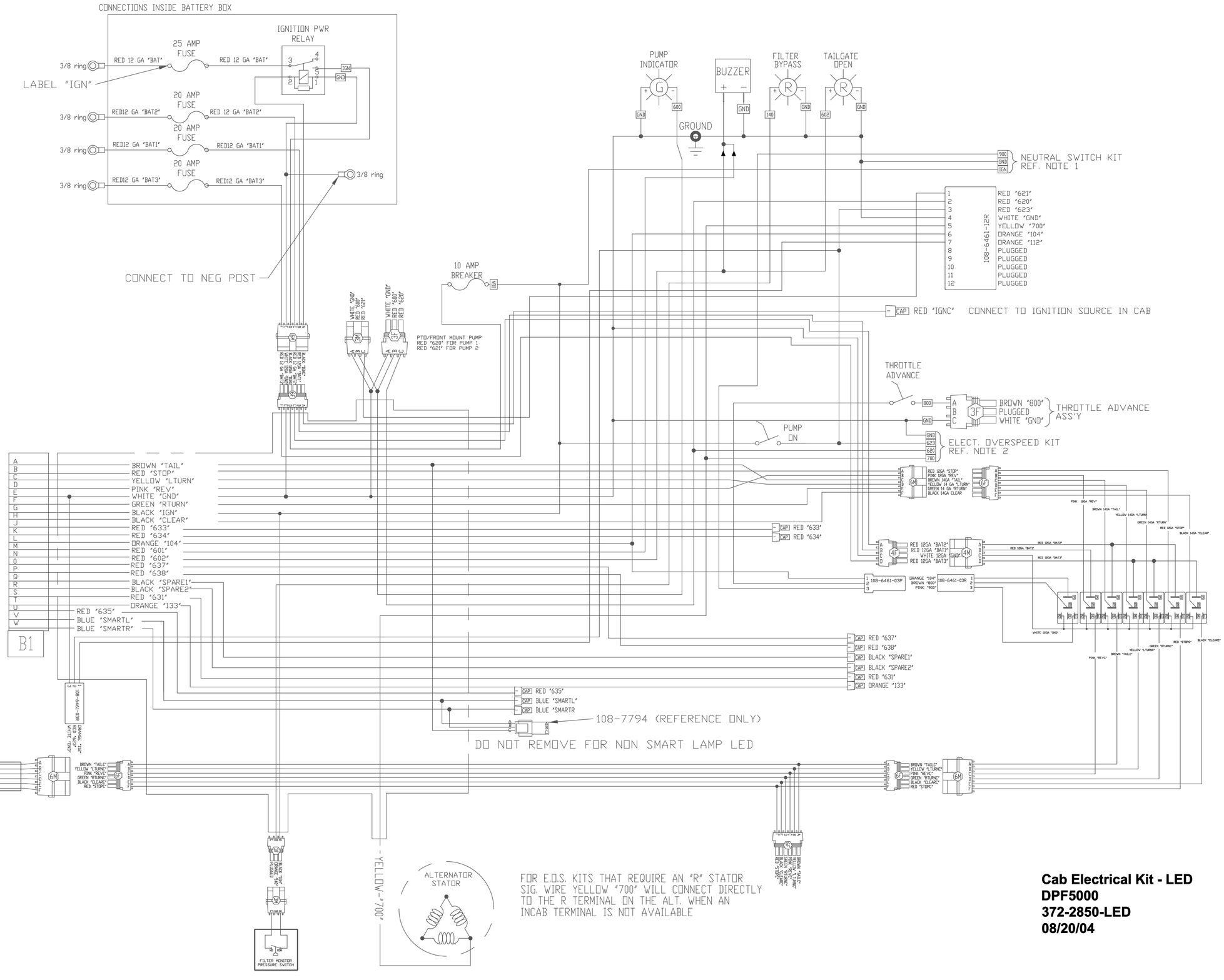
RED 12GA "BAT2"
RED 12GA "BAT1"
WHITE 12GA "GND"
RED 12GA "BAT3"

108-6461-03P

ORANGE "104"
BROWN "800"
PINK "900"

WHITE 12GA "GND"

Cab Electrical Kit
DPF5000 - Allied
372-1797
01/09/08



Cab Electrical Kit - LED
DPF5000
372-2850-LED
08/20/04

CONNECTIONS INSIDE BATTERY BOX

IGNITION PWR RELAY

25 AMP FUSE

20 AMP FUSE

20 AMP FUSE

20 AMP FUSE

3/8 ring

RED 12 GA "BAT"

RED 12 GA "BAT"

LABEL "IGN"

REDI2 GA "BAT2"

RED 12 GA "BAT2"

REDI2 GA "BAT1"

REDI2 GA "BAT1"

REDI2 GA "BAT3"

REDI2 GA "BAT3"

IGN

GND

CONNECT TO NEG POST

PUMP INDICATOR

BUZZER

FILTER BYPASS

TAILGATE OPEN

GROUND

600

140

602

NEUTRAL SWITCH KIT

900

GND

IGN

10 AMP BREAKER

SMART LAMPS ON

10 AMP BREAKER

108-6461-12R

1 RED "621"
2 RED "620"
3 RED "623"
4 WHITE "GND"
5 YELLOW "700"
6 ORANGE "104"
7 ORANGE "112"
8 PLUGGED
9 PLUGGED
10 PLUGGED
11 PLUGGED
12 PLUGGED

CAP RED "IGNC" CONNECT TO IGNITION SOURCE IN CAB

WHITE "GND" RED "620" RED "621"

WHITE "GND" RED "620" RED "620"

PTO/FRONT MOUNT PUMP
RED "620" FOR PUMP 1
RED "621" FOR PUMP 2

THROTTLE ADVANCE

800

GND

BROWN "800" PLUGGED WHITE "GND"

THROTTLE ADVANCE ASS'Y

PUMP ON

GND

623

620

700

ELECT. OVERSPEED KIT

RED 10GA "STOP"
PINK 10GA "REV"
BROWN 14GA "TAIL"
YELLOW 14 GA "LTURN"
GREEN 14 GA "RTURN"
BLACK 14GA CLEAR

CAP RED "633"
CAP RED "634"

RED 12GA "BAT2"
RED 12GA "BAT1"
WHITE 12GA
RED 12GA "BAT3"

GND

RED 10GA "BAT2"
RED 10GA "BAT1"
RED 10GA "BAT3"

108-6461-03P

ORANGE "104"
BROWN "800"
PINK "900"

108-6461-03R

WHITE 10GA "GND"

PINK 10GA "REV"
BROWN 14GA "TAIL"
YELLOW 14GA "LTURN"
GREEN 14GA "RTURN"
RED 10GA "STOP"
BLACK 14GA "CLEAR"

A BROWN "TAIL"
B RED "STOP"
C YELLOW "LTURN"
D PINK "REV"
E WHITE "GND"
F GREEN "RTURN"
G BLACK "IGN"
H BLACK "CLEAR"
J RED "633"
K RED "634"
L ORANGE "104"
M RED "601"
N RED "602"
O RED "637"
P RED "638"
Q BLACK "SPARE1"
R BLACK "SPARE2"
S RED "631"
T ORANGE "133"
U RED "635"
V BLUE "SMARTL"
W BLUE "SMARTR"
X RED "642"

B1

CAP RED "635"

CAP RED "637"
CAP RED "638"
CAP BLACK "SPARE1"
CAP BLACK "SPARE2"
CAP RED "631"
CAP ORANGE "133"
CAP RED "642"

108-6461-16CR

ORANGE "112"
ORANGE "104"
WHITE "GND"

REMOVE CONNECTOR AND WIRE BLUE "SMARTL" AND BLUE "SMARTR" AS SHOWN

BROWN "TAIL"
YELLOW "LTURN"
PINK "REV"
GREEN "RTURN"
BLACK "CLEAR"
RED "STOP"

BROWN "TAIL"
YELLOW "LTURN"
PINK "REV"
GREEN "RTURN"
BLACK "CLEAR"
RED "STOP"

BROWN "TAIL"
YELLOW "LTURN"
PINK "REV"
GREEN "RTURN"
BLACK "CLEAR"
RED "STOP"

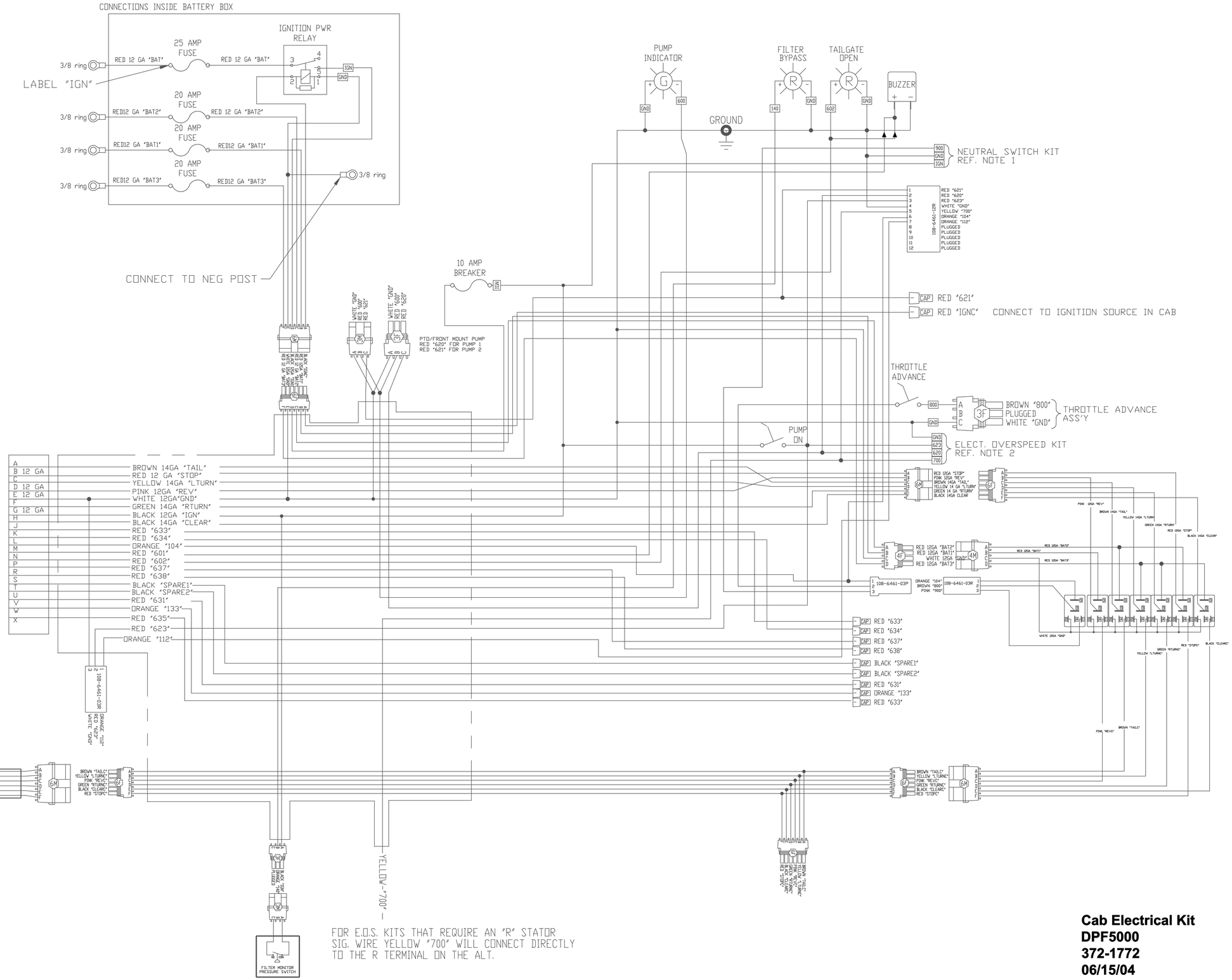
YELLOW "700"

ALTERNATOR STATOR

FOR E.D.S. KITS THAT REQUIRE AN "R" STATOR SIG. WIRE YELLOW "700" WILL CONNECT DIRECTLY TO THE R TERMINAL ON THE ALT. WHEN AN INCAB TERMINAL IS NOT AVAILABLE

FILTER MONITOR PRESSURE SWITCH

Cab Electrical Kit LED
DPF5000 SMART Lamps
372-2850-SMT
01/09/08



Cab Electrical Kit
DPF5000
372-1772
06/15/04

NOTES

1. NEUTRAL SWITCH KIT
 CHASSIS'S THAT PROVIDE A NEUTRAL TERMINAL IN THE CAB WILL NOT REQUIRE A NEUTRAL SWITCH KIT. CONNECT THE NEUTRAL WIRE DIRECTLY TO CHASSIS PROVIDED TERMINAL.
 IF THE PROVIDED SIGNAL IS POSITIVE (+12v) WIRE THE NEUTRAL RELAY AS SHOWN IN THE OVERALL SCHEMATIC. IF THE SIGNAL IS A GROUNDING SIGNAL WIRE THE NEUTRAL RELAY AS SHOWN IN DETAIL "A-A".
 FOR CHASSIS'S THAT DO NOT PROVIDE A NEUTRAL SIGNAL REFER TO THE NEUTRAL SWITCH KIT FOR NECESSARY WIRES AND CONNECTION POINTS. DISREGUARD ANY WIRES SHOWN ON THIS DRAWING WHICH ARE NOT REFERENCED IN THE APPLICABLE NEUTRAL SWITCH KIT.

2. ELECTRONIC OVERSPEED SWITCH KIT
 REFER THE E.O.S. KIT DRAWING FOR NECESSARY WIRES AND CONNECTION POINTS. DISREGUARD ANY WIRES SHOWN ON THIS DRAWING WHICH ARE NOT REFERENCED IN THE APPLICABLE OVERSPEED SWITCH KIT.
 IF E.O.S. IS NOT REQUESTED CONNECT THE PUMP SWITCH OUT PUT WIRE (RED '620') DIRECTLY TO THE PUMP OR P.T.O. SOLENOID.

3. P.T.O. WIRING
 WHEN INSTALLING AN AIR SHIFT P.T.O., CABLE SHIFT P.T.O., OR HOT SHIFT P.T.O. ON A TRANSMISSION OTHER THAN AN ALLISON WORLD TRANS. DISREGARD ALL "ELECTRIC SHIFT PUMP" P.T.O." WIRING SHOWN ON THIS DRAWING. USE COMPONENTS AND INSTRUCTIONS SUPPLIED WITH THE P.T.O. THE PUMP INDICATOR WIRE (RED '600'), IN THE CAB TO BODY HARNESS, CAN BE USED WHEN INSTALLING AN AIR OR CABLE SHIFT PTO FOR THE P.T.O. INDICATOR LIGHT GROUND.

4. D.O.T. LIGHT CONNECTIONS TO CHASSIS
 IF AVAILABLE REFERENCE THE CHASSIS MANUFACTURERS BODY BUILDERS MANUAL FOR ALL CONNECTIONS TO THE CHASSIS ELECTRICAL SYSTEM.
 THE HEIL BODY THIS KIT IS TO BE USED IN CONJUNCTION WITH IS WIRE WITH THE CLEARANCE AND TAIL LIGHTS ON SEPERATE CIRCUITS. IF THE CHASSIS USED DOES NOT HAVE SEPERATE CIRCUITS AVAILIBLE CONNECT BOTH THE TAIL AND CLEARANCE LIGHTS TO THE CHASSIS TAIL LIGHT CIRCUIT.

263-1062

263-1061

263-0075

108-7811-001

FOR E.O.S. KITS THAT REQUIRE AN "R" STATOR SIG. WIRE YELLOW '700' WILL CONNECT DIRECTLY TO THE R TERMINAL ON THE ALT. WHEN AN INCAB TERMINAL IS NOT AVAILABLE

DPF5000
ELECTRICAL SCHEMATIC
701-8469
05/06/03

HEIL ENVIRONMENTAL WARRANTY STATEMENT

The Heil Co. d/b/a Heil Environmental ("Heil") warrants its solid waste collection equipment to be free from defects in material and workmanship under normal single-shift use for a period of six (6) months or 1250 hours of operation (whichever comes first) from the date of equipment In-Service or during the period of coverage offered by an extended warranty program, when operated in accordance with its *Operator's Manual* and proper service and maintenance as described in Heil *Service Bulletins* and *Parts & Service Manuals* are performed. The standard or extended equipment warranty is not transferable except for sales demonstration units.

This warranty is expressly limited to the repair or replacement of any component or part thereof, of any such refuse or recycling collection body manufactured by Heil that is proven to Heil's satisfaction to have been defective in material or workmanship. Such components or parts shall be repaired or replaced at Heil's option without cost to the standard purchaser for parts and labor provided such unit is returned to an authorized Heil Dealer for replacement or repair. The repair or replacement must be made during the standard or extended warranty coverage period.

Before any warranty can be allowed on new equipment, a validated warranty registration form must be on file with Heil's Customer Service Department within sixty (60) days of the equipment's In-Service date. Wear items are excluded from warranty coverage.

All OEM service parts sold by Heil have a six (6) month warranty from the date of purchase. Aftermarket parts purchased from Heil are supported by a 90-day warranty. The parts warranty covers parts only, providing that factory inspection reveals a defect in material or workmanship. Labor, troubleshooting, equipment downtime, etc. is not covered under the parts warranty policy.

HEIL MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AND MAKES NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR ANY PARTICULAR PURPOSE. HEIL DOES NOT ASSUME ANY LIABILITY OR ACCEPT CLAIMS FOR LOSS OF PROFITS, PRODUCT DOWN TIME OR ANY OTHER DIRECT, INCIDENTAL OR INDIRECT CONSEQUENTIAL LOSSES, COSTS, DAMAGES OR DELAYS.

Any improper use, operation beyond rated equipment or component capacity, substitution of parts that are not Heil-approved, or any alteration or repair by others in such a manner as in Heil's sole judgment affect the product operation or integrity shall void the warranty.

Other than the extension of the standard warranty period purchased under a supplemental *Heil Extended Warranty Program*, no employee or representative is authorized to modify this warranty in any way nor shall any other warranties be granted. No dealer-supplied warranty program is endorsed or supported by Heil.

Heil retains the right to modify its factory warranty program prospectively at any time.